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Summer Library Reading Programs and Literacy: An Assessment of Children's Reading Progress After Having Participated in a Summer Library Reading Program

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SUMMER LIBRARY READING PROGRAMS AND LITERACY:

AN ASSESSMENT OF CHILDREN'S READING PROGRESS AFTER HAVING PARTICIPATED IN A SUMMER LIBRARY READING PROGRAM

by

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Abstract

This study examined the effects of a summer library reading program on children's reading progress. Sixty-nine children in second to fifth grade, ages 7-11, completed reading ability measures at two points: before and after participating in the summer library reading program, for the duration of July and August. For this quasi-experimental design, the treatment group consisted of 16 children who participated in the program, while the control group included 53 classmates who did not participate. Results showed that those who participated in the summer library reading program scored higher than the control group only in reading comprehension and not other components of reading, and that high reading frequency over the summer was associated with growth in reading skills. This demonstrates that frequent summer reading, and potentially participating in summer library reading programs may be associated with improvements in children's reading performance, suggesting that further implementation of and resources for these programs could be beneficial.

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Literature Review

Overview

Researchers have demonstrated that one way to improve reading skill is to increase the amount of text being read (Anderson, Wilson, & Fielding, 1988). The current study evaluates the effectiveness of a summer reading program at a local library, which aims to increase reading volume, for children ages 7-11. Summer reading interventions are necessary because children, particularly low socioeconomic status children, often experience reading decay over the summer holidays (McCoach, O'Connell, Reis, & Levitt, 2006). The literature review begins with an examination of the literature on children's reading growth in early elementary school and the relevant factors, including reading development over the summer holidays. This review is important to identify potential factors that are related to reading development. Particularly, factors related to reading development that are associated with socio-economic status are examined in this section. Next, *measures of reading achievement* are reviewed and include word reading, reading comprehension, working memory, and phonological awareness because these skills are key components in reading acquisition (Anthony & Lonigan, 2004; Bus & van Ijzendoorn, 1999; Gough & Tunmer, 1986). A section on *print exposure* and how it relates to reading development is also included, as print exposure has also been shown to be highly related to reading achievement (Chateau & Jared, 2000; Cunningham & Stanovich, 1998; McBride-Chang, Manis, Seidenberg, Custodio, & Doi, 1993). The

literature review will then examine *reading interventions and programs*, and their effects on children's literacy are reviewed to make clear the impact that these programs can have on children's reading skills. Lastly, an investigation of the impacts of *summer reading interventions* on children's literacy also provides a context for understanding the expected effects of the current study.

Early Literacy Development

Literacy environment. In a meta-analytic review, Baker, Scher, and Mackler (1997) analyzed the influences of family and home on children's reading motivation. Specifically, this article looked at children's early reading experiences in terms of shared storybook reading with parents and parents' attitudes toward reading. Of the many studies that were drawn on, a large focus was given to the Early Childhood Project, an ongoing longitudinal study, which looked at the influence of adults' beliefs and values on children's learning environments, as well as the impact of other social interactive processes, such as literary interactions with peers and siblings, on children's literacy. In general, it was found that children who have pleasant early experiences with reading, at a preschool age, were likely to read often and broadly in later years. Specifically, shared storybook reading from approximately ages two to four helped to promote motivation for reading. Furthermore, parents who had a positive attitude toward reading, viewing it as entertainment, were more effective in promoting motivation and enjoyment for reading in their children than were parents who focused more on the development of reading skills. It was concluded that parents' beliefs about and behaviours surrounding reading are related to their children's motivation to read, and that parents and teachers should work together to encourage children to read.

Another meta-analysis, performed by Bus, van IJzendoorn, and Pellegrini (1995), looked at home influences on the development of young children's reading abilities. The frequency of parent–preschooler book reading and several outcome measures were investigated in the first quantitative meta-analysis to be conducted on joint book reading, using thirty-three empirical studies. The outcome measures were divided into three categories: language growth, emergent literacy (or the skills necessary for reading development), and reading achievement. Searches of PsycLIT, ERIC, and Dissertation Abstracts International, earlier review papers, and references of the collected papers were used to collect the data for this study. This study had several findings. First, parent–preschooler book reading explained approximately eight percent of the variance in each of the outcome measures: language growth, emergent literacy, and reading achievement. Parent–preschooler book reading also seemed to be associated with children's acquisition of the written language register, or grammar used in written language. Additionally, parent-child book reading was not beneficial to only preschool-aged children. However, once children became able to read on their own, parent–child book reading was not as essential for children's reading. Differences in socioeconomic status had no influence on how parent–preschooler book reading affected children's reading. In conclusion, the authors stated that the results of this study provided support for the idea that literacy is often effectively transmitted across generations and that a home environment focusing on parent-preschooler reading can be beneficial for children's reading.

Evans, Shaw, and Bell (2000) also studied home influences on children's reading. Their research focused on the impacts of home reading experiences on phonological sensitivity, a topic that had not received much attention in previous research. The home

environments and language and literacy development of 66 children (aged 5-7) were examined. Interviews and home visits were conducted with the children's parents in order to collect demographic information, information about specific literacy practices, and to observe parent-child reading. Reading achievement was measured using the Test of Phonological Awareness-Kindergarten Version, the Peabody Picture Vocabulary Test-Revised, letter knowledge tasks, and word identification, word attack, and passage comprehension subtests of the Woodcock Reading Mastery Test-Revised. Children's reading was assessed at three points in time, in kindergarten, grade 1, and again in grade 2. Findings suggested that home activities involving letters were associated with increased reading achievement. This resulting letter name/sound knowledge and phonological sensitivity in kindergarten was associated with greater achievement in reading comprehension, phonological spelling, and conventional spelling in grade 2. The authors concluded that it would be beneficial for parents to provide home instruction to their children in terms of letter learning to enhance literacy skills.

Parental influence can also affect reading in children. As was previously mentioned, parents can help create an atmosphere promoting reading, which helps children to enjoy reading and be motivated to read. Furthermore, the activities that parents choose to engage in are related to the activities that their children prefer. When parents engage in reading with their children, and model a positive attitude toward and enjoyment of reading themselves, their children will enjoy reading and read often (Baker et al., 1997). Thus, a parent who chooses reading as a preferred activity is likely to have a child who will do the same.

The above studies all demonstrate that an atmosphere promoting reading helps children to enjoy reading and be motivated to read. The results of these studies suggest that home instruction and shared reading with children are associated with greater reading achievement and a more positive attitude toward reading.

Socioeconomic status. Further research shows that family income and the level of poverty a family lives in, or their socioeconomic status (SES), has an influence on children's reading growth, in that low SES is often associated with a lower rate of reading growth than high SES. Research conducted in the United Kingdom by Duncan and Seymour (2000) illustrates this pattern. These authors found that low SES children, ages four to eight, showed impairments in aspects of reading such as letter knowledge, word recognition and storage, and decoding ability in relation to high SES children.

Interestingly, much recent research shows that most of the discrepancies in reading skill in school-aged children that relate to SES actually originate over the summer holidays. High SES children tend to experience more reading growth over the summer than low SES children, creating differences in reading ability that carry over during the school year. Alexander, Entwisle, and Olson (2001) examined these differences related to SES in children's reading growth over the school year and summer months. Seven hundred and ninety children from 20 elementary schools in a low-income, urban, 'high-risk' area of Baltimore completed the California Achievement Test (CAT) to measure their reading level. Data on reading achievement, demographics, and socioeconomic standing were also obtained through school records and parent interviews. Family SES was determined using information on parental education, parental occupation, and

whether or not the children received reduced-price school meals. While children of high and low SES were found to make similar gains in reading level during the school year, they did not advance at the same pace over the summer. Results showed that higher SES children had some reading growth over the summer while low SES children had no growth; their reading skills stayed at the same level. These findings suggest that schooling allows children to progress at a similar pace in their reading development, regardless of SES. It is their activities outside of school that create the disparities in reading skill. It was concluded that the out-of-school environment (the home and community) may create more disparity in children's reading progress than does the school environment. That is, the time children spend out of school, such as the summer months, is more likely to contribute to differences in reading skill than in-school instruction.

An early assessment of the Early Childhood Longitudinal Study – Kindergarten Cohort provides further support for the effect of socioeconomic status on children's reading abilities. In contrast to most previous research, this study examined reading growth longitudinally, as opposed to at one point in time. McCoach, O'Connell, Reis, and Levitt (2006) assessed reading growth in a group of children when they were in kindergarten, and again when they were in first grade using the Peabody Individual Achievement Test–Revised, the Peabody Picture Vocabulary Test–Third Edition, the Primary Test of Cognitive Skills, and the Woodcock–Johnson Psychoeducational Battery-Revised, among other measures. These data were collected at four points in time; the fall and spring of kindergarten, and the fall and spring of grade 1. SES was measured using information on family income, parental education, and parental occupation.

Hierarchical linear modeling was performed to analyze the data, with nesting of school and student-level variables. Findings pertaining to the current study suggested that student-level variables (such as SES, ethnicity, and gender) impacted reading growth more than school-level variables (such as percentage of minority students or percentage of free-lunch students). SES was not related to reading growth during the school year, but had a large impact on summer reading growth. While low SES children had slight reading decay over the summer, students from high SES families showed slight reading improvements. It was also found that children showed more reading growth in grade 1 than in kindergarten. This suggests that between-school differences in achievement are largely explained by the differing academic levels of the students who attend the school, rather than differences in school resources or instruction, and that low SES children can benefit from preschool and summer interventions to keep their reading skills at the level of their high SES classmates.

These studies clearly demonstrate that children from high SES families experience more reading growth outside of school, particularly in the summer months, than do children from low SES families. It seems that summer reading interventions are helpful for low SES children, to prevent their reading skills from slipping over the summer, or even to improve those skills.

Components of Reading

The literature review continues with a discussion of phonological processing, reading comprehension, working memory, and word reading variables in relation to reading achievement as these are important components of reading. An understanding of

the development of these skills is important to consider when designing a summer intervention program.

Phonological processing. Phonological processing, or the ability to perceive and distinguish between differences in phonemes and speech sounds, seems to play a causal role in the process of learning to read (Wagner & Torgesen, 1987). In their literature review on phonological processing and its role in reading acquisition, Wagner and Torgesen also suggested that phonological recoding, or the recoding of letters into a sound-based representational system, is important in order to maintain or remember these letters and their associated sounds efficiently while reading. This is a major process involved in learning to read. Additionally, Anthony and Lonigan (2004) studied phonological awareness as a causal variable in reading acquisition. These authors found that phonological awareness consists of several components that play a role in learning to read. These components include rhyme sensitivity (or the ability to detect rhymes), the ability to identify and distinguish phonemes, competence in separating words into sounds (segmental awareness), and the understanding of and ability to manipulate word structure (phonological sensitivity). Snow, Griffin, and Burns (1998) also discuss the importance of phonological awareness, indicating that initial reading instruction requires a focus on phonological awareness, because children need to understand the structure of spoken words and how sounds are represented alphabetically in order to learn to read. Finally, in a meta-analysis, Bus and van Ijzendoorn (1999) demonstrated that phonological awareness accounts for about 12% of the variance in word-identification skills. Therefore, based on the above evidence and many additional studies, phonological processing and awareness are important in learning to read.

Reading comprehension. Reading comprehension is also a key feature of reading skill (Gough & Tunmer, 1986). Since reading comprehension is associated with higher level language comprehension skills (e.g. inference-making), children can have good word reading and cognitive skills while having poor reading comprehension (Oakhill, 1994). Cain, Oakhill, and Bryant (2000) examine the relationship between reading comprehension and other high level components of reading, such as inference-making. The authors suspect that inferential skills have an effect on reading comprehension performance, which is important for success in reading. Reading comprehension performance is crucial for school success and "reading to learn" (Chall, 1983).

Working memory. Working memory is the ability to remember or maintain small amounts of information in the mind in order to use that information to perform tasks, such as reading (Caretti, Borella, Cornoldi, & De Beni, 2009). In this way, working memory plays a crucial role in supporting learning. Verbal working memory capacity is highly related to reading performance in that working memory skills play a key role in developing reading ability (Caretti, Borella, Cornoldi, & De Beni, 2009; Cain, Oakhill, & Lemmon, 2004; Gathercole, Alloway, Willis, & Adams, 2006). This is strongly suggested by the fact that reading difficulties are associated with poor working memory skills because decoding and comprehension of words requires children to hold larger amounts of information in their minds at one time. Thus, those with poor working memory skills may not be able to manage the working memory load required for reading (Gathercole et al., 2006).

Word reading. Reading comprehension is also dependent on decoding, or word reading skill, and listening comprehension, as proposed by Gough and Tunmer (1986).

To decode, one must simply be able to understand and identify the sounds that a word makes, while comprehension involves understanding what the words mean. The authors suggest that, although there are varying views on which components of reading are more important, decoding and listening comprehension both play key roles in reading. According to Gough and Tunmer, then, decoding is one of the key components in reading.

The above studies present different positions in terms of which component of reading is most important. However, it can be seen that word reading, reading comprehension, working memory, and phonological awareness variables are all key components in reading acquisition and are therefore appropriate measures of reading achievement.

Print Exposure and Reading Development

Exposure to print refers to the amount of text (books, magazines, etc.) people have been exposed to or have read (Stanovich & West, 1989). Previous research on reading achievement in elementary school-aged children shows that high performance on measures of print exposure is associated with high scores on measures of reading achievement (Chateau & Jared, 2000; Cunningham & Stanovich, 1998; McBride-Chang et al., 1993). The relationship between the number of books children are familiar with and reading achievement was investigated further in a study performed by Stanovich and Cunningham (1997). Fifty-six children who completed a battery of reading tasks in first grade were followed up in grade 11. In eleventh grade, they were assessed on exposure to print, general knowledge, vocabulary, and reading comprehension. It was found that reading ability in grade 1 was highly related to all reading outcomes in grade eleven.

Interestingly, first-grade reading ability (as well as reading ability in grades three and five) was one predictor of exposure to print in eleventh grade. This suggests that acquiring reading ability quickly in first grade helps to develop a lifetime habit of reading. Individual differences in exposure to print were also found to predict differences in reading comprehension ability throughout the school years.

This relationship between print exposure and reading ability seems to be bidirectional; that is, print exposure and reading ability influence each other rather than one causing the other. Cipielewski and Stanovich (1992) found that children who had a large amount of exposure to print when they were young developed better reading skills. In this study, children who had been exposed to more books when they were young showed more reading growth by grade five than children who had less print exposure. That is, exposure to print predicted individual differences in reading growth between grades three and five; print exposure accounted for a significant amount of variance (11% and 8% for the TRT and ART, respectively) in reading comprehension. It seems that more exposure to print is associated with improved reading development, suggesting that if individuals score high on print exposure, they are also likely to have strong reading skills. Therefore, it seems that print exposure is highly related to reading achievement, and this supports the creation of a summer reading program to ensure higher levels of print exposure for children over the summer holidays.

Reading Interventions and Programs

There is an additional area of research showing that children's reading achievement benefits from interventions, both during the school year and over the summer months. Coyne, Kame'enui, Simmons, and Harn (2004) looked at children who

participated in a 7-month intensive beginning reading intervention in kindergarten and the resulting progress they made with reading instruction in first grade. The authors tested an 'inoculation' hypothesis, that this strategic, intensive, and timely early reading intervention could prevent further reading difficulties in the first grade for at-risk children. Fifty-nine first-grade children, who achieved criterion levels on measures of phonological awareness and alphabetic knowledge after the kindergarten intervention, were randomly assigned to receive either classroom instruction only, or classroom instruction along with a complementary maintenance intervention, which consisted of an extra 30 minutes of instruction, daily, along with the initial intervention. The classroom instruction focused on developing phonological awareness, letter–sound connections, decoding strategies, and text reading, while the maintenance intervention involved re-emphasizing what was learned in the classroom instruction. Pre-test between-groups analyses demonstrated that there were no differences between the two groups on any measures before the interventions. Results showed that study participants did experience an 'inoculation' effect in February of first grade, in which they performed above average in real word and nonword reading and average in reading comprehension, as compared with a national normative sample. However, it was also found that participating in the maintenance intervention, in addition to the classroom instruction, did not have any benefits for the students, perhaps because this intervention was redundant and unnecessary to maintain growth in their reading skills. Due to the nature of the classroom instruction, Coyne and colleagues determined that, because a school is such a complex host environment, intervention and prevention efforts concerning reading difficulties

need to occur at a broader, school wide level in order to coordinate the intervention efforts successfully.

Further evidence for the benefits of reading interventions is provided by Al Otaiba, Connor, Lane, Kosanovich, Schatschneider, Dyrlund, Miller, and Wright (2008), who investigated the effects of a Reading First intervention in eight Reading First elementary schools for 286 kindergarten students. Reading First is a federally-funded American educational program that had been implemented in high poverty schools and is designed to improve students' reading abilities through the use of research-based instruction, teacher training, assessment, and program evaluation. In this study, teachers provided 15 minutes of comprehension and vocabulary instruction per day, and over 30 minutes of phonics and phonological awareness instruction per day to the kindergarten participants. Children's reading skills were then assessed on measures of phonological awareness and letter naming and decoding fluency. Results showed that children experienced significant growth from fall to spring on phonological awareness and letter naming and decoding fluency.

Finally, Saint-Laurent and Giasson (2005) found that a family literacy program for first graders, implemented over the course of a school year, had positive effects on children's reading and writing. The family literacy program consisted of nine workshops for parents and children on topics such as book reading and school success, playing with letters, functional reading, listening to a beginning/developing reader, and writing plays. In these workshops, the parents were taught skills for working with their children on these various aspects of reading. One hundred and eight participants were randomly assigned to treatment (program) and control conditions, 53 in the treatment group and 55

in the control group. Pre- and post-test group comparisons on measures of phonological awareness, concepts about print, invented spelling, and attitude toward reading demonstrated that treatment participants experienced significant gains in reading and had significantly higher reading and writing scores than control participants. It was concluded that reading interventions, particularly those emphasizing parent involvement, are associated with improvements in reading and writing.

In summary, the findings of the above studies show that an effective reading intervention should occur at a broad, school-wide or community-wide level, as well as have a high level of parent involvement. Examples of summer reading interventions that fit these criteria will be discussed in the next section.

Summer Reading Interventions

Given that low SES children often experience reading decay over the summer holidays, summer reading interventions are important to try to keep these children from falling behind in reading. The literature review concludes with a discussion of summer reading interventions. The following studies look specifically at summer reading interventions and their effects for the children involved. Kim (2007) evaluated the effects of a summer reading intervention on children's reading progress by measuring children's reading achievement and reading frequency before and after having participated in a summer reading program. Two hundred and seventy nine demographically diverse children from grades 1 to 5 were randomly assigned to one of two groups; one group received ten books matched to their reading levels and preferences to read over the summer, and the other group received their ten books in September, after treatment group

data had been collected for the study. A pre-test took place in June, using the Stanford Achievement Test-Tenth Edition, the Elementary Reading Attitudes Survey, and a reading preference survey. These same measures were used at the post-test in September to collect data after the treatment group had the opportunity to read their books over the summer. The treatment group reported a higher frequency of reading and participation in literacy activities over the summer than did the control group, but there were no significant differences in reading achievement between the treatment and control groups. It is important to note, however, that there were statistically nonsignificant group differences, with the grade five group showing the most reading improvement after receiving the intervention. The authors suggested that young readers may not benefit from a voluntary reading intervention when there is no assistance from teachers, parents, or tutors in terms of word decoding and comprehension. More teacher-directed instruction as a part of a summer reading intervention could help to improve students' reading achievement over the summer holidays.

Kim and White (2008) then followed up this study by examining the effects of a summer reading program with more teacher- and parent-directed instruction. Four hundred children in Grades 3 to 5, and 24 teachers participated in this study. The children were randomly assigned to one of four experimental conditions: a control condition where no intervention occurred, a books-only condition in which children received books to read over the summer but no formal instruction, a books with oral reading scaffolding condition, and a books with oral reading and comprehension scaffolding condition. In the oral reading scaffolding condition, children received books to read over the summer as well as scaffolding-type instruction in oral reading, which included shared reading with

parents and assistance from parents over the summer. In the oral reading and comprehension scaffolding condition, participants received books and scaffolding-type instruction in oral reading, as well as instruction in comprehension, in which teachers provided lessons in comprehension strategies at the end of the school year. The books children received were matched to their interests as well as reading levels. Participants' reading skills were assessed at pre- and posttests on measures of oral reading fluency (DIBELS) and silent reading ability (Iowa Test of Basic Skills [ITBS]). Kim and White found that children who received books and oral reading and comprehension instruction performed significantly better on the ITBS posttest than those in the control condition. Furthermore, participants in the two scaffolding conditions combined showed increased performance on the ITBS posttest over children in the control and books only conditions combined. It was concluded that summer reading interventions are more effective when they include direct reading instruction or assistance from parents or teachers.

Schacter (2003) also evaluated the impact of a summer reading intervention on children's reading performance, but with a specific focus on economically disadvantaged children. A total of 51 first-grade children participated in this study. All children were economically disadvantaged and went to schools with average reading scores below the 25th percentile. The treatment group was made up of 21 children, who were then enrolled in a summer reading camp, a new intervention context developed by the author. The summer reading camp experience included 2 hours of systematic reading instruction a day over an 8-week period. There was also a comparison group, consisting of 30 participants, who were not enrolled in the summer reading camp, but whose parents received training to implement effective summer reading strategies with their children.

Reading performance of both groups was assessed before and after the intervention using the following measures: the Gates-MacGinitie Vocabulary Level 1-Fourth Edition, the Gates-MacGinitie Comprehension Level 1-Fourth Edition, the CORE Phonics Survey, and the Fry Oral Reading Survey. At the pretest, the control group had significantly higher reading achievement than the treatment group. However, posttest results showed that after having participated in the summer reading camp, the treatment participants significantly outperformed the control participants on all measures of reading achievement, that is, in reading vocabulary, reading comprehension, phonics skills, and oral reading. Schacter, and Jo (2005) later replicated these findings with a larger sample of first graders, and again found that the reading camp participants showed improved reading compared with the control participants. These results show that this summer reading camp intervention is related not only to the prevention of summer reading loss, but also to gains in reading performance.

An additional study, performed by Luftig (2003), provides further support for the success of summer reading interventions. One hundred and sixty-eight elementary school children at-risk for reading failure, in grades one through four, participated in one of two short-term summer school intervention programs. The two intervention programs were a school-based program, and a program designed and implemented by a for-profit company that focuses on improving student academics. Children entering grade one in the fall did not receive the private intervention. Across age groups, there were 50 participants in the school-based intervention, 33 participants in the private intervention, and 78 control children. All participants were recruited from the same school, which was chosen by the Department of Education to receive funding due to its high rate of academic failure.

Reading achievement for the grade one children was measured using the Summer Success Reading Test, while the Gates MacGinitie Reading Test was used to measure the children in grades two through four. Participants who received one of the two intervention programs made significant reading improvements over the control group. There were no differences between the children who participated in the school-based intervention and the private intervention, suggesting that they were both effective. The author concluded that reading remediation over the summer can lead to improvements in children's reading abilities, and that these summer reading interventions should be pursued further.

The above studies clearly demonstrate that summer reading interventions and programs can have a positive effect on children's reading skills. The most effective of these programs seem to include teacher or parent assistance. A popular venue for encouraging summer reading is programs sponsored by local libraries. Although this research shows support for many types of summer reading interventions, research is needed on the effects of library summer reading programs, in particular, on children's reading achievement, as no known empirical evidence exists regarding the effectiveness of these programs, even though they are widely funded. In addition, much of the literature on summer reading interventions and programs is American. This study provides a Canadian perspective. In this way, by evaluating a summer library reading program, this study fills in the gaps in the literature on summer reading programs.

Purpose and Hypotheses

The aim of the present study was to evaluate the effectiveness of a summer library reading program. Specifically, the study examines the value of the program for children from low socioeconomic status schools. As previously stated, research is needed on the effects of library summer reading programs, in particular, on children's reading achievement, as no known empirical evidence exists regarding the effectiveness of these programs. It was also previously discussed that low SES children often demonstrate either no growth or a decrease in their reading skills during the summer months, in contrast with high SES children who usually experience slight reading growth over the summer (Alexander et al., 2001; McCoach et al., 2006). However, positive effects of out-of-school reading and of intervention programs on literacy have been demonstrated, particularly for low SES children (Coyne et al., 2004; Luftig, 2003; Saint-Laurent & Giasson, 2005; Schacter & Jo, 2005). Therefore, it was hypothesized that (1) participants enrolled in the summer library reading program would have better overall reading skills after having participated in the reading program than their classmates who did not participate when taking into account previous reading skill, and (2) those children who participated in the summer library reading program would have better overall reading skills after having participated in the library summer reading program than they did before participating, demonstrating growth in reading. Lastly, due to the fact that reading frequency influences reading growth (Anderson et al., 1988), it was predicted that (3) the frequency of summer reading would affect how much reading growth occurs over the summer.

By evaluating this reading program empirically, teachers and parents should be able to appreciate the true value and effectiveness of summer library reading programs for elementary school-aged children, adding evidence to the current research that similar interventions are beneficial. This study adds to the literature on summer reading interventions by providing the first evaluation of a summer reading program sponsored by a local library.

Method

Research Design

The evaluation of the summer library reading program was conducted using a quasi-experimental pretest-posttest design with a non-treatment control group. Participants were tested at two times: (1) May and (2) September. At both times, participants completed the testing battery (as described in the next section). The treatment group was made up of children who were enrolled in the summer library reading program, for the duration of July and August. The non-treatment control group consisted of children from the same classes as the treatment group and they were tested in May and September as well, but were not enrolled in the summer library reading program. Children were also classified as high or low readers, based on the amount they had read over the summer.

Participants and Recruitment

Sixty nine students (29 boys and 40 girls) attending nearby public schools in Waterloo Region, Ontario participated in this study. Participants were recruited from grade 2 to 5 classrooms at five local schools, and therefore ranged in age from 7-11 years. This age range was chosen because it encompasses the ages used in most of the previous

literature on reading interventions (Kim, & White, 2008; Luftig, 2003; Schacter, 2003). The treatment group had a mean age of 9 years and 8 months, while the control group had a mean age of 9 years and 5 months. The high reader group had a mean age of 9 years and 7 months, while the low reader group had a mean age of 9 years and 5 months. These differences were not statistically significant. The target group was low SES children in Waterloo or Waterloo region, many of whom also belonged to multicultural communities. Since these children were all from the Kitchener-Waterloo area, it should be recognized that they are working class low SES rather than welfare low SES, as would be found somewhere like Toronto. Thus, although they are still low SES, they would be higher income than the low SES children found in other areas. Students were selected from schools in Waterloo region that identified themselves as low SES based on the school board. This was determined by using a community report, A Focus on Young Children in Waterloo Region, produced by the Ontario Early Years Program using 2001 data from Stats Canada (*Ontario Early Years*, 2005). Since it was the schools that were identified as low or high SES, it is, therefore, possible that some mid to high SES students attend these schools and so not all of the participants were necessarily low SES. However, as SES was not measured as a variable in this study, the use of a sample that may not be entirely low SES was not a major problem. The rationale for selecting children from these schools is that they are less likely to have large numbers of books in the home and therefore less likely to engage in extensive home reading in the summer (Alexander et al., 2001) without the assistance of the library. And so, participating in a summer library reading program would help these children to engage in more summer reading.

Further demographic information was obtained from 51 of the 69 participants. Thirty eight participants had parents who spoke English as a first language, while 13 participants had parents who did not speak English as a first language. Other languages included Vietnamese, Kurdish, Farsi, Mandarin, Amharic, Romanian, Urdu, and Filipino. Parents of 35 participants were born in Canada, while parents of 16 participants were born elsewhere. Other countries of origin were Vietnam, Kurdistan (Turkey), Sudan, Jamaica, Iran, Scotland, China, Ethiopia, Romania, Pakistan, Afghanistan, the U.S, and the Philippines.

Data was also collected on several quantitative variables, such as highest level of parent education, number of children's books in the house, number of times parent and child visit local library each month, parent English skills, preferred parent activities, and number of books children read over the summer. Highest level of parent education was coded as follows:

1 = elementary school
2 = some high school
3 = completed high school
4 = some college or university
5 = completed college diploma
6 = completed undergraduate degree
7 = some postgraduate studies
8 = completed graduate or professional degree

Parent English skill was coded on a scale of 1 to 10, 1 being low skill and 10 being high skill. Preferred parent activity was coded on a scale of 0 to 4. Parents could indicate whether they preferred reading over other activities a minimum of 0 and a maximum of 4 times on the demographic questionnaire.

Averages were calculated on these quantitative demographic variables for all of the 51 participants from whom researchers were able to obtain this information. On

average, parents indicated 5.08 on the education scale, suggesting that the average parent from this sample had completed a college diploma. The average number of children's books in the house was 5.33. The average number of times parents and children visited their local library each month was 1.74. Parents rated their English skills as 9.2 on average. The average rating for parent activity preference was 2.04, indicating that parents preferred reading over other activities two times out of four. Lastly, the average child read 16.46 books over the summer. Averages were also calculated for these quantitative variables comparing treatment and control groups, and high and low readers, and are displayed in Tables 1 and 2, respectively.

The recruitment process was as follows. Participants were first recruited to the overall study. Consent was obtained from the principals of the relevant schools first (see Appendix A for the consent form for the principal), and then consent forms and invitation letters (see Appendices B and C, respectively) were sent home with the children for their parents to sign. Once participants returned their signed consent forms, indicating that they would participate in the testing, they (with the assistance of their parents) self-selected to either participate or not in the library sponsored summer reading program at the Kitchener Public Library. That is, they decided based on the information they had received about the program, whether or not they wished to participate. Sixteen participants (seven boys and nine girls) selected to be in this treatment group, while 53 participants (22 boys and 31 girls) selected to be in the control group. Those who wished to enroll in the summer reading club were then asked to contact the Kitchener Public Library to register, and the researchers obtained a list of participants in the study who were enrolled in the summer reading club, as well as a list of study participants who were

not enrolled. Once participants had indicated that they would not participate in the reading program, they were asked to inform the researchers if their children would be participating in a different summer reading program. Parents were asked to return consent forms by May 1, 2010. Researchers collected these consent forms from the schools. Once consent forms were received, an additional information letter was sent home with details about the program and the testing. Oral assent was also obtained from the children at both testing times (see Appendix D for statement of oral consent).

All children received small gifts, such as decorated pencils, erasers, or small toys for participating. Additionally, all participants received a book at the end of the study, and additional books were donated to the participants' classrooms.

Measures

Participants completed a testing battery at two times: (1) May 2010 and (2) September 2010. The testing battery consisted of the following measures related to reading and cognitive ability (all measures are published and considered to have high reliability and validity, and are meant to be used for this age group). All of the tests had stopping rules meant to prevent frustration by discontinuing the test if it became too difficult. As discussed in the literature review, the variables measured are key aspects of reading and are therefore appropriate measures of reading achievement. Table 3 depicts the design and constructs that were measured at each data collection time. Tables 4 and 5 show correlation matrices of the reading measures.

Word reading: fluency and accuracy. Standardized sub-tests of word and pseudoword reading from the Woodcock Reading Mastery Test-Revised (WRMT-R/NU) were administered (Woodcock, 1998). Participants were asked to read words and

pseudowords aloud (e.g. cat, ift). Sight word efficiency and phonetic decoding efficiency subtests of the Test of Word Reading Efficiency (TOWRE) were also used to assess the number of printed words and pronounceable printed nonwords that can be accurately identified in 45 seconds. For these tests, participants simply read aloud as many words or nonwords as possible in 45 seconds (Torgesen, Wagner, & Rashotte, 1999).

Phonological awareness. Subtests of the Comprehensive Test of Phonological Processing (CTOPP), specifically the segmenting words and nonwords subtests and the elision subtest were administered (Wagner, Torgesen, & Rashotte, 1999). In the segmenting words and nonwords subtests, children were asked to separate the sounds in a word or a nonword (eg. m-a-n), and in the elision subtest, children would repeat a word, omitting a certain sound (e.g. Say popcorn without saying corn).

Reading comprehension. Using the Woodcock Language Proficiency Battery-Revised, oral passage comprehension was measured (Woodcock, 1991). The passage comprehension measure examines the child's ability to understand information read silently by having the individual read a sentence or short passage where individual words have been omitted. The participant provides the most appropriate word to fill in the blank given the meaning of the sentence or passage (e.g. the bird _ flying). Passages range from simple sentences to more complicated paragraphs in which participants must fill in the blank.

Working memory. Working memory is most highly related to reading comprehension. The memory for digits subtest of the CTOPP was used to measure working memory. In this subtest, participants heard a string of digits and were required to repeat the digits in the reverse order (e.g. 5 2 repeated backwards is 2 5).

Vocabulary. The Peabody Picture Vocabulary Test-III (PPVT III) (Dunn & Dunn, 1997) was used to measure receptive vocabulary. The PPVT III involves students pointing to a picture that corresponds to a word read by the researcher. The Expressive Vocabulary Test (EVT) (Williams, 1997) was also used and is designed to measure expressive vocabulary and word retrieval and asks participants to give synonyms for common words (e.g. tell me another word for "hop". Answers: jump, bounce, etc.).

Automaticity. Rapid automatized naming is associated with the fluency of retrieval of verbal labels and with automaticity in word reading, which allows greater resources to be available for reading comprehension. The RAN digits subtest from the CTOPP was administered to measure automaticity. The students were required to read a list of numbers as quickly and accurately as possible. The time taken to read the list of numbers, and errors made were recorded.

Grammar. Grammatical awareness was measured using the sentence assembly subtest of the Clinical Evaluation of Language Fundamentals-III (CELF-III) (Semel, Wiig, & Secord, 1995). This test required participants to produce two grammatically correct sentences from words or phrases presented in a visual form (e.g. rearrange the following words into a sentence: the dog, the man, followed by, was. Answer: the man was followed by the dog, etc).

Non-verbal reasoning. Nonverbal reasoning was assessed using a subtest of the Matrix Analogies Test (Naglieri, 1989). Students were asked to select the item (shapes, for example) that correctly completes the pattern. The MAT is considered a relatively culture free test. It assessed students' nonverbal ability, to determine if students' learning potential was broadly within the average range.

Print exposure. Print exposure was measured using the Title Recognition Test (TRT) (revised by Grant & Gottardo based on Cunningham & Stanovich, 1991). The children were asked to select whether a title in a list was a real title or a foil. Wrong answers were subtracted from right ones to prevent guessing. Cronbach's alpha was calculated as a measure of reliability for this version of the TRT. An alpha of 0.921 was achieved, which is quite high. This suggests that the items on the TRT were internally consistent.

Demographic questionnaire. In May 2010, parents were asked to fill out a demographic questionnaire (Appendix E). Information such as parent language and education, visits to the library, number of children's books available, and hours children read over the summer was obtained using this questionnaire. The questionnaire was then used in conjunction with the data in order to examine general trends between certain demographic information and child reading ability.

Procedure

As previously stated, participants completed the testing battery at two times: (1) May and (2) September. This testing took place during school hours, as each session took approximately one hour (for a total testing time of 2 hours). All testers were trained and experienced in administering tests, and followed the existing standardized procedures for administering the tests. Testers maintained a relaxed and patient demeanor with the children. All participants were given an ID number so that names would not be attached to the testing battery.

Testers went to the school on the designated testing days, and tested approximately two children at once (as each tester can only test one child at a time).

Testers explained to the children that they were being tested to find out what they know. They were also told to try their best but that these tests would not be on their report cards. Children were told that testers would be measuring how they read and that testers would not report this information to their parents or teachers. After obtaining oral consent from the participants, testers proceeded through the testing battery, taking notes to record the data. Throughout testing, children were not provided with feedback based on performance. Children were encouraged and praised constantly regardless of performance.

Parents also received the language and demographic questionnaire (see Appendix E), and a parent activity preference questionnaire, (see Appendix F) to complete at this time. Additionally, a reading at home tracking sheet (See Appendix G) was sent home for parents to complete over the summer, in which they were to record the number of hours and number of books their children read per week. Finally, parents received an information letter, informing them of the next phase of the study, and how to enroll in the summer reading club. Then, those in the treatment group participated in the summer reading program, and both groups were tested again in September. The same procedure was employed at the second testing time.

Each participant who enrolled in the summer library reading program became a member of the Summer Reading Club. Participants began registering on Monday, June 28, 2010, and the program began immediately after registration. The majority of participants were a part of this program for the duration of July and August. As a part of the program, participants obtained small prizes and games by reading books and completing related tasks. The program was rather unstructured in that participants could

come to the library as much as they wished over the summer. Participants were, however, encouraged to come to the library at least once a week. Once at the library, participants signed out books, and played a game that involved rolling a die and moving across a game board to complete various reading and other tasks. Once children completed the tasks they entered a draw to win prizes. Children tried to read as many books as possible and library staff listened to oral book reports or read brief written book reports for each book that was read. They also helped children to pick out age-appropriate and interesting books. The main purpose of the program was to increase the frequency of children's summer reading by providing reading material, thereby fostering reading improvement in fluency, vocabulary, and most important, reading enjoyment and confidence.

Unfortunately, most participants did not return their reading at home tracking sheets at the end of the summer. Because of this, researchers obtained this data by asking children to estimate how much they had read over the summer. This data was then used to classify children as either high or low readers. Children were put in the high reader group if they had read more than 10 books over the summer. If children had read 10 or fewer books, they were classified as low readers. There were 17 children (eight boys and nine girls) in the high reader group and 44 children (19 boys and 25 girls) in the low reader group. There were several reasons for choosing 10 books as the cutoff for high and low readers. The main reason was that there seemed to be a clear gap in the data around 10 books. That is, there was a large group of participants who read between 0 and 10 books, and a large group of participants who read significantly more than 10 books. Many of these participants read 30 or 40 books. It was also necessary to choose the high number of 10 books as the cutoff because the data was obtained from children's self-reports of how

much they read. It is likely that children would over report the number of books they read over the summer for social desirability reasons.

Results

Overview

It should be noted that for all analyses, the p-values were divided by two, because SPSS calculated the p-value for a two-sided test. For the purposes of the present study, a one-sided test was more appropriate since all hypotheses were directional. That is, the researchers were interested only in whether improvements in reading were made, not in whether decreases in reading skill occurred as a result of being in the intervention program.

Mean reading scores for the treatment and control groups at pre-test are displayed in Table 6, while mean reading scores for the treatment and control groups at post-test are shown in Table 7. Mean reading scores for each reading measure for high and low readers at pre-test are depicted in Table 8, while mean reading scores for high and low readers at post-test are depicted in Table 9.

Analytic Plan

Hypothesis #1: participants enrolled in the summer library reading program will have better overall reading skills after having participated in the reading program than their classmates who did not participate when taking into account previous reading skill. Two between-subjects multivariate analyses of covariance were conducted on the difference scores between reading scores at the pre and post-test (with

the dependent measures being reading scores on each reading measure). The purpose of these analyses was to look for differences between the treatment and control groups, as well as between high and low readers. The first MANCOVA used treatment group as the independent variable. For this analysis, the covariate was participants' age in years and months, given that studies show that the effects of reading interventions on reading skill are more pronounced in older children (Kim, 2007). The second MANCOVA used treatment group and frequency of summer reading both as independent variables and had several covariates. In addition to age, parent education was also used as a covariate because it is known to be associated with reading skill (Alexander et al., 2001), and Matrix Analogies score at pre-test was used as a covariate because it measured cognitive ability before the treatment occurred. The MANCOVAs were both conducted using the same set of dependent measures: word reading, phonological awareness, reading comprehension, working memory, vocabulary, automaticity, grammar, and print exposure. For this particular research question, comparisons were examined between the difference scores of the treatment and control groups for each of the reading measures. It was predicted that the treatment group would have larger difference scores than the control group, indicating that they experienced more reading growth over the summer. A follow-up paired samples t-test was performed to see whether the treatment group actually read significantly more than the control group, and to address the second hypothesis. This will be discussed in the next section. Lastly, four independent samples t-tests were conducted to further examine an interaction between treatment group and reading frequency that was found to be significant.

The initial MANCOVA, using treatment group as the independent variable, with age in months as the covariate, did not show any significant results, $F(15, 52) = 0.54$, $p = 0.90$ (using the Wilks' Lambda statistic). However, the other MANCOVA did have some results that were significant. The second MANCOVA was conducted to further examine this potential relationship. The independent variables in this analysis were treatment group and summer book reading frequency, and the covariates were age, highest level of parent education, and MAT score at pre-test. Although there was no overall effect of treatment group, $F(15, 26) = 0.73$, $p = 0.73$, reading frequency, $F(15, 26) = 1.04$, $p = 0.45$, or the interaction between treatment group and reading frequency $F(15, 26) = 0.80$, $p = 0.67$, post-hoc tests were performed because some reading growth was expected to occur..Growth was expected as a result of program participation, given that previous summer reading interventions produce reading growth (Kim & White, 2008; Luftig, 2003; Schacter, 2003; Schacter & Jo, 2005). Furthermore, growth was expected as a result of broad summer reading, given that reading fluency increases with experience. Thus, reading frequency should result in reading growth (Anderson et al., 1988). An interaction was expected to be present because the program goal was to increase reading. Therefore, program participants who read frequently should experience more improvements than program participants who did not read frequently (Anderson et al., 1988). Results demonstrated that the treatment group showed significant improvements over the control group in reading comprehension. Specifically, these differences were found in the passage comprehension subtest of the Woodcock Language Proficiency Battery – Revised, $F(1, 40) = 4.09$, $p = 0.03$, $\eta^2 = 0.09$. This significant result likely occurred in the analysis with treatment group and summer book reading both as

independent variables (and not in the analysis with only treatment group as the independent variable) because there was a significant interaction between treatment group and summer book reading when the passage comprehension measure was the dependent variable, $F(1, 40) = 4.76, p = 0.02, \eta^2 = 0.11$. Thus, high readers in the treatment group showed significant improvements in reading comprehension over high readers in the control group. However, low readers in the treatment group showed less improvement in reading comprehension than low readers in the control group. This relationship is depicted in Figure 1. This would explain why significant results did not occur when only treatment group was used as the independent variable. Treatment group was interacting with summer book reading frequency, together resulting in improvements in reading comprehension for program participants. Thus, although some program participants read many books and experienced reading gains, some did not read much. In this way, overall there was actually no significant difference between the mean amount read by the treatment ($M = 21.60$) and control groups ($M = 14.83$), $t(60) = 0.96, p = 0.34$. although there is a nonsignificant difference. The above MANCOVA results are displayed in Table 10. The table shows only results for Word ID, RAN Digits, Segmenting Nonwords, and Passage Comprehension because these were the only reading measures to show significance or near significance in any of the analyses.

To further examine the interaction between reading frequency and treatment group in terms of reading comprehension, four independent samples t-tests were conducted. Treatment group low readers were compared with control group low readers, and treatment group low readers were compared with control group high readers. Also, treatment group high readers were compared with control group low readers, and

treatment group high readers were compared with control group high readers. There were no differences in the reading gains experienced when comparing those in the treatment group who were low readers with those in the control group who were low readers, $t(42) = 0.87, p = 0.39$. Also, there were no differences in reading gains between those in the treatment group who were low readers and those in the control group who were high readers, $t(20) = -0.45, p = 0.66$. Furthermore, high readers in the treatment group showed no difference in summer reading improvements from low readers in the control group $t(37) = -1.12, p = 0.27$. Interestingly, though, high readers in the treatment group made significantly more summer reading gains than high readers in the control group, $t(15) = -2.21, p = 0.04$.

Hypothesis #2: those children who participated in the summer library reading program will have better overall reading skills after having participated in the library summer reading program than they did before participating, demonstrating growth in reading. Paired samples t-tests were performed as a follow up to further understand the data, and to investigate whether children had better reading skills after participating in the summer library reading program than they did before participating. These paired samples t-tests were conducted on raw scores (at the pre and post-test) for treatment and control groups on the reading measure that showed significant or near significant results in the multivariate analyses (when looking at treatment group as the dependent variable). Reading comprehension was the dependent variable since it was the only significant measure in the MANCOVA.

The prediction was that, for the treatment group, the post-test scores would be higher than the pre-test scores, indicating that reading growth occurred over the summer. The control group was not expected to have significant gains in reading growth over the summer. Therefore, the t-tests compared pre- and post-test reading scores for treatment and control groups.

For those in the treatment group, there was no significant improvement in reading comprehension, $t(15) = -0.52$, $p = 0.31$. The control group also showed no significant reading growth over the summer, $t(52) = -0.15$, $p = 0.44$. Thus, when the analyses were conducted comparing the treatment and control groups, neither group made significant gains over the summer.

This is contradictory to the results of the multivariate analysis, which showed that the treatment group made more gains in reading comprehension over the summer than the control group. However, the t-test did not take reading frequency into account as the multivariate analysis did. Participants may have needed to read a significant amount over the summer along with program participation in order to experience improvements.

Hypothesis #3: the frequency of summer reading will affect how much reading growth occurs over the summer. To test this hypothesis, another MANCOVA was conducted on the difference scores between the pre and post-test, using frequency of summer reading as the independent variable (more specifically, the number of books read over the summer). The same dependent variables were used: word reading, phonological awareness, reading comprehension, working memory, vocabulary, automaticity, grammar, and print exposure. Age was used as the covariate. It was predicted that high

readers would have larger difference scores than low readers, indicating that they experienced more reading growth over the summer.

Although there was no overall effect of reading frequency, $F(15, 44) = 1.13, p = 0.36$, post-hoc tests were performed because some reading growth was expected to occur. Growth was expected as a result of broad summer reading, given that reading fluency increases with experience. Thus, reading frequency should result in reading growth (Anderson et al., 1988). Results showed significant differences in the reading scores of high and low readers on measures of phonological awareness (Segmenting Nonwords), $F(1, 58) = 3.69, p = 0.03, \eta^2 = 0.06$, and automaticity (RAN Digits), $F(1, 58) = 3.72, p = 0.03, \eta^2 = 0.06$. It should be noted that the difference for word reading (Word Identification) was nonsignificant, ($F(1, 58) = 3.6, p = 0.06, \eta^2 = 0.06$) because it was conducted at the two-tailed level rather than the one-tailed level. A two-tailed test was used because the low readers showed significantly more improvement than the high readers, which was not what the one-tailed hypothesis had predicted. The results are depicted in Table 11. The table shows only results for Word ID, RAN Digits, Segmenting Nonwords, and Passage Comprehension because these were the only reading measures to show significance in any of the analyses.

Additional t-tests were also performed on reading frequency, to see whether high readers had improved reading skills after the summer than they did before the summer, because few significant results had been obtained thus far on treatment group differences. These paired samples t-tests was conducted on raw scores (at the pre and post-test) for high and low readers on the reading measures that showed significant or near significant

results in the multivariate analyses (when looking at treatment group and/or frequency of summer reading as the dependent variable(s)). For the t-tests using reading frequency as the independent variable, dependent measures used were RAN Digits, Segmenting Nonwords, Sentence Assembly, and Word ID. T-tests using reading frequency as the independent variable were also performed on vocabulary and word reading measures.

The rationale for including the vocabulary measure in these analyses is that vocabulary is likely to increase with increased reading due to "reading to learn" (Chall, 1983). The more children read, the more they will come across new vocabulary, and, thus, learn that new vocabulary. The rationale for including the word reading measures is that, based on previous literature, reading fluency should increase with experience (Anderson et al., 1988).

The prediction was that, for high readers, the post-test scores would be higher than the pre-test scores, indicating that reading growth occurred over the summer. The low reading group were not expected to have significant gains in reading growth over the summer. Therefore, the t-tests compared pre- and post-test reading scores for high and low reader groups.

The t-tests using reading frequency as the independent variable showed that, for those who were classified as high readers (having read more than 10 books), there were improvements on all but one of the reading measures. The Woodcock Reading Mastery Test-Revised (WRMT-R/NU) Word ID subtest, a measure of word reading, fluency, and accuracy, was the nonsignificant result, with $t(16) = -0.95$, $p = 0.18$. The other results showed that there were significant improvements in reading skill in the children who read

a lot over the summer. Two other measures of word reading, fluency, and accuracy, the reading words and nonwords subtests of the Test of Word Reading Efficiency (TOWRE), showed that children had significant improvements in reading. The results for the reading words subtest were as follows: $t(16) = -3.81$. $p = 0.001$. The results for the reading nonwords subtest were $t(16) = -1.93$, $p = 0.04$. It was also found that high readers made significant improvements in vocabulary over the summer, as was measured by the Peabody Picture Vocabulary Test (PPVT), $t(16) = -4.66$, $p < 0.001$. These children showed improvements in phonological awareness as well, specifically in the segmenting nonwords subtest of the Comprehensive Test of Phonological Processing (CTOPP), $t(16) = -1.89$, $p = 0.04$. Lastly, improvements in automaticity in reading digits were demonstrated by frequent summer readers, which was measured by the RAN digits subtest of the Comprehensive Test of Phonological Processing (CTOPP), $t(16) = -1.95$, $p = 0.04$.

For those who were classified as low summer readers (having read 10 books or less), some significant improvements in areas of reading still occurred. These low readers did show significant improvements in word reading, fluency, and accuracy, with significant results in WRMT-R/NU Word ID, $t(43) = -5.18$, $p < 0.001$, TOWRE words $t(43) = -5.56$, $p < 0.001$, and TOWRE nonwords, $t(43) = -2.84$, $p = 0.004$. These low readers also made significant improvements in vocabulary over the summer, as was measured by the PPVT, $t(43) = -3.08$, $p = 0.002$. However, the low readers did not show any improvement in phonological awareness, as did the high readers, since the low readers did not show any improvement in the segmenting nonwords subtest of the CTOPP, $t(43) = 0.00$, $p = 0.5$. Furthermore, these low readers did not show improvement

in automaticity in reading digits, as measured by the RAN digits subtest of the CTOPP, $t(43) = 0.92, p = 0.18$.

Additional analyses. The following analyses were conducted to help understand the results. A MANCOVA was conducted to examine equivalence between treatment groups and high and low readers on reading measures at the pre-test. Age was again used as a covariate, since older children are likely to be better readers than younger children.

The MANCOVA examining equivalence between treatment groups and between high and low readers on reading measures at the pre-test showed equivalence between the treatment and control groups at pre-test on all reading measures, $F(15, 42) = 0.69, p = 0.78$. Since this test was not conducted to answer a directional hypothesis, it was performed as a two-tailed test. No significant differences were found at the two-tailed level. Likewise, there was equivalence between high and low readers at pre-test on all reading measures, $F(15, 42) = 0.63, p = 0.83$. This suggests that group means were equivalent at pre-test on all of the reading measures.

Several correlation coefficients were also calculated between various demographic variables. Coefficients were obtained to determine the relationship between parent activity preference and frequency of summer reading, parent education and the number of children's books in the house, number of times parents and children visit the library each month and the number of books children read over the summer, parent education and parent activity preference, parent activity preference and the number of children's books in the house, parent activity preference and the number of times parents

and children visit the library each month, and parent English skills and the number of children's books in the house.

These correlations are depicted in Table 12. The correlation between parent activity preference and frequency of summer reading was significant, $r = 0.32$, $p = 0.02$, suggesting that the more parents enjoy reading, the more likely children are to read. A significant positive correlation was also found between parent education and the number of children's books in the house, $r = 0.33$, $p = 0.01$. This suggests that the more education a parent has, the more likely he or she is to have many children's books in the home. Results also showed that that the more times parents and children visit the library each month, the more books children read over the summer, $r = 0.28$, $p = 0.03$. Parent education was significantly correlated with parent activity preference, suggesting that the more education parents have, the more they enjoy reading, $r = 0.25$, $p = 0.05$. Additionally, parents who enjoyed reading were likely to have a larger number of children's books in the house, $r = 0.4$, $p = 0.003$. Parent activity preference was also found to be related to the number of times parents and children visit the library each month. That is, parents who enjoy reading are also likely to take their children to visit the library often, $r = 0.32$, $p = 0.02$. Furthermore, a significant positive correlation exists between parent English skills and the number of children's books in the house, $r = 0.42$, $p = 0.01$, indicating that the higher a parent's self-reported skill in English, the more children's books he or she is likely to keep in the house.

Discussion

Contributions to Knowledge

Although more research is needed to better determine whether participating in summer library reading programs is related to reading improvement, the results of this study present some valuable contributions to knowledge on the effects of summer library reading programs, as well as the effects of reading frequency. The significant effects that were found suggest that there may be some benefits to participating in summer library reading programs, as well as to reading frequently over the summer.

Summer library reading programs. It was hypothesized that participants enrolled in the summer library reading program would have better overall reading skills after having participated in the reading program than their classmates who did not participate when taking into account previous reading skill. As participating in the summer reading program at the Kitchener Public Library only produced improvements in one area of reading, reading comprehension, it cannot be concluded at this time that participating in the program leads to great improvements in reading. This does not mean, however, that participating in summer library reading programs does not lead to reading improvement. There were limitations to this study (which will be discussed in the limitation section) that may have prevented reading improvements from being demonstrated in this case. Also, there were found to be significant gains in reading comprehension in those who were enrolled in the reading program. Those who were not enrolled in the program did not improve in reading comprehension compared to the group participating. Therefore, according to this study, there is some potential for summer

library reading programs to show an association with improved skills in reading comprehension, taking into account age, parent education, and cognitive ability. That in and of itself would be an important benefit to these library programs, given that reading comprehension is a key component in overall reading skill. Furthermore, the previous literature on summer reading interventions shows that they are often related to improvements in reading (Kim & White, 2008; Luftig, 2003; Schacter, 2003; Schacter & Jo, 2005).Therefore, it is still possible that further research could more strongly demonstrate positive impacts of these summer library reading programs.

It makes sense that reading comprehension would be the area in which program participants experienced improvement in because of the age and resulting skills of the participants. The participants are generally of an age at which the "learning to read" process has already occurred, and so accuracy in reading and phonological awareness should already be well-developed. Children of this age would be at the level to develop "reading to learn", in which they comprehend and gain knowledge from what they are reading rather than just reading in order to improve decoding skills (Chall, 1986). Therefore, increased reading as promoted by the library program would not be expected to improve accuracy or phonological awareness, as these skills should already be developed. The program would be expected to improve reading comprehension.

Interestingly, the significant interaction between treatment group and reading frequency suggests that the amount children read over the summer affects whether or not they experience improvements in reading comprehension as a result of participating in the program. Thus, those children who were in the summer library reading program and read a lot over the summer showed significant improvements in reading comprehension

over those who read a lot in the control group. However, those who were in the program but did not read much over the summer showed less growth in reading comprehension than those in the control group who did not read much. It should be mentioned that the sample of high readers who participated in the program was very small, which makes it difficult to make comparisons or draw conclusions on the effectiveness of the program or of broad summer reading. As far as the interaction between program participation and summer reading frequency, it certainly makes sense that children would need to read a significant amount for the program to be effective. After all, encouraging frequent summer reading is the essence of the program. Perhaps those children who enrolled in the program but did not read very much on their own were enrolled because they were already struggling in reading or needed assistance. This might be why they performed worse than the control group low readers. In this case, they would have had to read more in order for the program to be effective in improving their reading comprehension. It is also possible that, for struggling readers, more assistance is needed to make improvements in reading over the summer than this basic summer library reading program. They may need direct instruction in decoding and comprehending written text to improve their reading skills (Kim, 2007), something that summer library reading programs do not offer. Perhaps the broad reading aspect of these library programs has the potential to be more effective in improving reading skills of average and higher level readers than low level readers. At the very least, these programs are not effective if the children do not read.

The t-tests conducted to further investigate this interaction showed only one significant difference in reading comprehension between high readers who participated in

the program and high readers who did not participate in the program. In this way, the program appears to be having a positive effect on children who read a lot; the program may be providing something to its participants other than just the benefits of increased independent reading. Perhaps program participants are profiting from the reading tasks they take part in as a part of the program. It is also possible that program participants are more likely to attend additional summer reading instructional programs provided by the library, because spending time at the library would make them aware that these programs exist. They also may be interested in further programs given that they chose to participate in the Summer Reading Club. Attending other instructional reading programs at the library would likely result in increased reading skill for these participants. There are potential explanations for the lack of significant results for the rest of these t-tests. Low readers would not be expected to make many summer reading gains whether they attended the program or not simply because they are not reading much. Similarly, low readers who attended the program may not differ from high readers who did not because the program participants did not read enough to make improvements over those who read a lot but did not attend the program. Lastly, high readers who attended the program did make more reading gains than low readers who were not in the program, but this difference was not significant. A greater difference would be expected between the treatment group high readers and the control group low readers than between the treatment group high readers and the control group high readers. This was not the case. However, perhaps the high reader control group contained some low level readers, who would likely experience gains in accuracy as a result of broad reading, rather than gains in comprehension (Chall, 1986). If this were the case, the mean of the high reader control

group could have been lower than the mean of the low reader control group on reading comprehension.

It should again be mentioned that the initial multivariate analysis, with only program participation as the independent variable, showed no significant results for any of the dependent reading measures. This could be because of the interaction between reading frequency and program participation. When both these variables were included as independent variables, reading comprehension was found to be significant. Therefore, participating in the program is potentially related to gains in reading comprehension, but this may be only if children read a significant amount.

It should also be noted that the paired samples t-tests, which were conducted to compare improvements in reading comprehension made by the treatment and control groups, did not find significant improvements. This is contradictory to the results of the multivariate analysis, which showed that the treatment group made greater reading gains over the summer than the control group. These results also do not prove the second hypothesis, that those children who participated in the summer library reading program would have better overall reading skills after having participated in the library summer reading program than they did before participating, demonstrating growth in reading. However, this null result could have been because the t-test did not take reading frequency into account, as the multivariate analysis did. Participants needed to read a significant amount over the summer for the program to be effective. Since some of the program participants read very little over the summer, this could be why the t-tests did not show significant gains in reading. The nature of the program could be changed to

better encourage all children participating to read a lot. For example, further reading tasks, activities, and group reading sessions could be incorporated when children come to the library for the program. It is also possible that children would read more if they received prizes or incentives for each book they have read. Suggested improvements to the program will be discussed in more detail in the practical implications section.

Additional research is needed to determine how effective these programs are in improving reading skill over the summer. Studies similar to the current one could be conducted to do this, perhaps investigating the effects of several summer library programs across Ontario and using larger sample sizes.

Reading frequency. Due to the fact that reading frequency influences reading growth (Anderson et al., 1988), the third hypothesis predicted that frequency of summer reading would affect how much reading growth occurred over the summer. This hypothesis was somewhat supported, given that the multivariate analysis with reading frequency as the independent variable did find significant differences in reading improvement over the summer between high and low readers on two reading measures, RAN Digits, and Segmenting Nonwords. This suggests that reading frequently over the summer results in growth in the following components of reading: automaticity, and phonological processing. Reading little over the summer does not seem to result in improvements in these areas. Although the present study did not find that program participants read much more than the children who did not participate, if these library programs can promote more summer reading, then they should be able to produce improvements in reading skill, given that automaticity, and phonological processing are vital components in overall reading skill. It should be noted that low readers actually

experienced significant improvements over high readers in word reading, which is contradictory to the present hypothesis. However, low readers are more likely than high readers to be struggling readers, and so would have more room to improve, especially in accuracy, which develops before fluency and comprehension skills. High readers are likely to have more developed accuracy skills if their reading skills are higher in general, and so would have less room for improvement.

These results are in accordance with the current literature on the topic as it has been shown that reading fluency increases with experience; thus, reading frequency should result in reading growth (Anderson et al., 1988). The results of this study are suggesting just that; that children who engage in a large amount of summer reading experience more improvements in reading over the summer than children who read less.

The fact that most reading measures did not have significant results suggests that, when it comes to some components of reading, such as grammar, and vocabulary, reading a significant amount does not lead to more growth than reading little. This is not to say that no improvements in reading occurred. As will be discussed later, this only means that high readers did not experience more growth in some aspects of reading than low readers did.

The results of the follow up t-tests show that high readers demonstrate significant growth in word reading, vocabulary, phonological awareness, and automaticity. However, low readers also showed significant improvements in some of the same reading components. Low readers improved in word reading, and vocabulary. It should be noted that the low readers did not show any growth in phonological processing, or automaticity.

This would suggest that the improvements made in phonological processing and automaticity were related to children reading a lot over the summer, while improvements made in word reading and vocabulary were due to other factors. Previous research shows that low SES children either experience no gains or slight reading decay over the summer (Alexander et al., 2001; McCoach et al., 2006). On the other hand, the present study suggests that, in some cases, low SES children experience reading growth over the summer, regardless of how much they read. Perhaps the children in this study were not as low in socioeconomic status as children in previous research, and thus they do not experience the same setbacks in summer reading. Regardless of the reasons behind this discrepancy, summer reading loss in children of various socioeconomic statuses should be examined in further research.

The fact that both high and low readers improved in some areas of reading could be explained in a number of ways. First of all, there may have been a test-retest effect. In other words, children could have found the reading tasks easier at the post-test simply because they had already performed these tasks once. If this were the case, the improvements these children made on the reading tasks may not have necessarily meant that they experienced reading growth. They could have just become familiar with the reading tests.

It is also possible that the improvements that occurred in word reading and vocabulary were developmental, since these gains were made for both high and low readers. Thus, although improvements occurred in these areas, they could have been due to developmental influences rather than frequency of reading. Some literature suggests

that some aspects of reading develop simply with age as opposed to with schooling and instruction. For example, Ferreira and Morrison found that children's metalinguistic knowledge increases as a normal part of development (Ferreira, & Morrison, 1994). Additionally, Varnhagen, Morrison, and Everall (1994) suggest that improvements in general memory capacity and development of cognitive resources are related to age rather than schooling in mid-SES children. As has been mentioned before, the participants of this study may have turned out to be more mid-SES than low SES. In the case of this study then, it is possible that some of the growth in word reading and vocabulary was developmental, rather than due to reading frequency.

Interpretation of correlations. The correlation analyses that were conducted on the demographic variables found several significant correlations. Interpretations of these correlations will be discussed. Firstly, the correlation between parent activity preference and frequency of summer reading suggests that the more parents enjoy reading, the more likely their children are to read. This is in accordance with the previous literature, which suggests that parents who have a positive attitude toward reading, viewing it as entertainment, are more effective in promoting motivation and enjoyment for reading in their children than are parents who focus more on the development of reading skills (Baker et al., 1997). In this way, parents' beliefs about and behaviours surrounding reading (such as having a high regard for reading) seem to play an important role in influencing their children's motivation to read, though motivation was not studied here.

The significant positive correlation that was found between parent education and the number of children's books in the house suggests that the more education a parent

has, the more likely he or she is to have many children's books in the home. Highly educated parents seem to be more concerned with promoting reading in the home than less educated parents. And as we have already discussed, parents' beliefs about and behaviours surrounding reading seem to be successful in influencing their children's motivation to read (Baker et al., 1997).

Results also showed that visiting the library seems to be successful in encouraging children to read more, given that there was a significant correlation between the number of times parents and children visit the library each month and the number of books children read over the summer. Not only are children who choose to visit the library more likely to be interested in and motivated to read, but parents who take their children to the library are also likely to be motivated to promote reading for their children. There is also the simple possibility that going to the library makes many books available to children, thus they have the opportunity to read more.

In terms of parents' preferred activities, this was correlated with parent education, suggesting that the more education parents have, the more they enjoy reading. This is likely related to the fact that highly educated parents also tend to promote more reading in their children by keeping many children's books in the house. Parents who are highly educated, and thus are concerned with promoting reading for their children probably do this because they enjoy reading themselves and recognize its value. Therefore, it also makes sense that parents who enjoy reading are also likely to have a larger number of children's books in the house. Parents' activity preferences were also related to the number of times parents and children visited the library each month. That is, parents who

enjoyed reading were also likely to take their children to visit the library often. All these correlations tie into each other, such that parents who enjoy reading for fun are likely highly educated, and so find value in promoting reading in their children by keeping many children's books in the house, and taking their children to visit the library often.

Finally, the higher parents evaluate their English skills, the more children's books they are likely to keep in the house. Since level of education affects parents' promotion of reading in the home, it would also make sense that parental English skills would affect parents' promotion of reading in the home. A parent who is confident in his or her English skills would most likely be more comfortable reading for enjoyment in English than a parent who feels he or she has poor English skills. Also, as we know, a parent who is comfortable with and enjoys reading will encourage their children to read in the home as well.

These results all suggest that parents' attitudes toward reading affect children's reading habits. Additionally, it seems that the more reading parents do with their children, the more their children will want to read. This is consistent with the previous literature, demonstrating that parental attitudes and shared book reading affect children's attitudes toward and skill in reading (Baker et al., 1997; Bus et al., 1995; Evans et al., 2000).

Limitations and Future Research

Limitations of the research. There were several limitations present in this study that could be adapted for future research. For example, there were limitations to the sample that was used in the current study. First of all, there were more participants in the control group than the treatment group, with 53 children in the control group and 16

children in the treatment group. The fact that these groups were not even may have affected the results. More importantly, however, power was reduced because of the small size of the treatment group. The treatment group may have achieved more significant results if there were a larger sample size, and thus more statistical power.

This problem of low sample size in the treatment group is likely due to the fact that participants chose whether to be in the treatment group or control group. In this case, it was ethically difficult to use random assignment to assign participants to treatment and control groups. Researchers did not feel that it was ethical to force some participants to attend the library program, while forbidding others to participate. Due to this, only a quarter of the study's participants elected to be in the treatment group. Perhaps there was a fundamental difference between the children who were willing to participate in the summer library reading program and the children who did not participate. This problem could be addressed by randomly assigning children to participate or not in a summer library intervention, if this were a feasible option in the future. Some of those who attended the program may have already been high level readers and so did not have much room for improvement. Some of the program participants also may have been struggling readers whose parents decided to enroll them in the library program to try to improve their reading. In this case, these children may have needed more assistance in reading than the library program could offer. While the library program only offers the benefits of extensive reading, struggling readers may have needed direct instruction.

There were also more low readers than high readers, with 44 children classified as low readers and 17 children classified as high readers based on how many books they

read over the summer. The groups were divided this way because there was a clear gap in the data between those who read little and those who read a lot. However, this may have affected the results given that the high reader group was very small. The high reader group may have achieved more significant results if there were a larger sample size, and thus more statistical power.

The lack of significant results may also have to do with the fact that the target group was low socioeconomic status (SES). This study was meant to examine the benefits of summer reading programs for low SES children. Since low SES children are more likely to be struggling readers than high SES children (Alexander et al., 2001), again, these children may need more assistance in reading than the library programs can offer.

It is also possible that the sample was not representative of the overall population of low socioeconomic status children. Socioeconomic status was determined by obtaining lists of schools that identified themselves as low SES. Children were then recruited from these schools. Although the schools generally identified themselves as low SES, there may have been children at these schools that were mid to high SES, and some of these children may have been participants in the current study. Therefore, this study may not have truly captured the effects of summer library reading programs, or of frequent summer reading for low SES children.

A limitation to the method of data collection was that the measure of grammar, CELF-3 Sentence Assembly, was intended to be used for children aged nine and older. In the present study, this subtest was used on seven and eight year-olds as well as older

children. Although this was corrected for when scoring the data, it is still possible that grammar was not accurately measured for the seven and eight year-olds because this test was too difficult for them.

As far as analyses, there were a large number of statistical tests conducted in order to obtain the few significant results that were found. This results in a greater likelihood that the significant results that were obtained were due to chance or random error rather than a significant effect. This was a limitation as well.

There were also some limitations to the library program itself. Since the program was unstructured, children could sign up for the program, but still not read over the summer. Although the program encourages children to read frequently, they do not all necessarily read very much. Additionally, in this case, researchers were not able to obtain data on how often children actually attended the program. Therefore, there was no objective, independently validated way of knowing how often children attended the program, as well as what kind of books they read. Only self-report data regarding how many books were read was available. If this information were available, it could have been taken into account in analysis. Some participants may have read age appropriate books while others did not. Also, since, in this case, participation in the library program did not lead to much improvement in reading, there may be aspects of the summer library reading program that are not effective in producing reading growth.

Furthermore, the measure of how much children read over the summer was perhaps not as accurate as it could have been. Children and their parents were asked to complete a reading tracking sheet over the summer, listing how many hours and how

many books they read each week. However, most participants did not return this form, so researchers simply asked children to estimate how many books and hours they read over the summer. Needless to say that a child's estimate of books and hours read over the summer may not be very accurate. The number of hours read over the summer would be the hardest for children to estimate, which is why the number of books read was the variable used in analysis. Still, this may not have been the most accurate way to measure the number of books read over the summer. Unfortunately, data on the number and type of books borrowed by program participants was not provided by the library.

Suggestions for future research. Further research on summer library reading programs should address the limitations previously discussed. These limitations could be addressed in several ways, and adaptations could be made in future research on the subject. Firstly, several changes could be made to the sampling process. To address the problems with the sample, a larger overall sample should be used in future research, so as to obtain more participants in the treatment group, as well more high readers. Participants could be randomly assigned to either treatment or control groups, in order to obtain an equal number of participants in these groups, as well as to correct any problems caused by fundamental differences between those who choose to participate in the program and those who do not. This would allow future researchers to capture a truly random sample of the population of low socioeconomic status children, whether they are low level readers or high level readers. Or perhaps, further pre-testing could be conducted in which information is obtained about the amount participants read as well as whether they plan to attend a summer reading program at a local library. This way, treatment and control groups, as well as high and low reader groups could be created in equal numbers.

However, this would not ensure that those who choose to participate in the library program are not different than those who do not participate. Only random assignment would do that. These suggestions may help future researchers to determine more significant differences in the gains made by children who attend library summer reading programs and children who do not.

To ensure that the sample is truly capturing children from low socioeconomic status (SES) families, this information could be obtained at an initial test, as was discussed earlier. Children and families could complete questionnaires, giving information on income and SES (as well as on reading frequency and whether the children will be attending the library program) prior to the pre-test. Once this information is obtained, future researchers could either select only low SES children to participate in the study, or compare low and high SES. That way it could be determined whether high SES children make more gains than low SES children in reading as a result of program participation, and whether they make more reading gains as a result of frequent reading. It could also be determined whether high SES children are more likely than low SES children to enroll in the library program and whether they read and participate in literacy activities more often.

It would be quite simple to address the problem of the measure of grammar, CELF-3 Sentence Assembly, not being an appropriate measure for children under the age of nine. Future researchers could simply use a different test to measure grammar.

Several things could be done in order to correct the issues with the summer library reading program. First of all, records could be made of how often children attend the

program and what kind of books they read. These factors could then be used in analysis to determine if frequency of program attendance and level of books read affect gains made in reading skill. Also, a wider scale study could be conducted on summer reading programs at a number of different libraries across the region. There are certainly slight differences between the way this program is carried out at different libraries. A comparison of the program at different libraries and the reading improvements made by children attending at each library could illuminate this issue. Research comparing the programs at a number of Ontario libraries could determine the most effective ways of executing these summer reading programs. Specifically, it could be established how to successfully encourage children to read frequently while participating in this program. Also, since the unstructured nature of the library program did not lead all participants to increase their summer reading, changes could be made to the program to remedy this. Potential improvements to the program will be discussed in the next section.

Finally, the method of collecting data on children's summer reading frequency could be improved for future research. In this case, since most participants did not return their reading tracking sheet, researchers simply asked children to estimate how many books and hours they read over the summer. A more accurate way of measuring summer reading may be to obtain records from the library (or libraries) of how much children read over the summer. Of course, this would only work for those children who participate in a summer library reading program. Perhaps for the control group, reminders could be sent throughout the summer to assist children and parents in remembering to record their summer reading. Phone checks could also be performed periodically throughout the summer to gather data on how much participants are reading.

There are other options for further study of the effects of summer library reading programs and reading frequency on children's reading progress. To begin with, additional studies should replicate this study in order to better understand the effects of summer library reading programs on reading progress. Some of the limitations previously discussed, such the small sample size in the treatment group may have prevented the current study from finding significant results. Further studies with equal and larger numbers in the treatment and control groups may find significant results. Also, as was previously mentioned, a wider scale study could be conducted on summer reading programs at a number of different libraries across the region to gain a wider perspective of the effects of these programs. Differences between the programs could also be examined to see which methods are most effective.

Related research could also expand to look at other programs offered by public libraries during the summer, such as programs that involve more direct instruction in reading. The Kitchener Public Library has several programs like this, one of them being Read Aloud Partners, in which young children are paired with volunteers to read and receive assistance. This would help children who are struggling with reading. Research could even compare the effects of the summer reading club with these other types of summer programs offered by the library.

The effects of these library programs could be examined for different ages as well. It may be that older children would experience more reading improvement from participating in these programs, given that some previous research found that older children benefit more from broad reading than do younger children (Kim, 2007). A study

like this could be conducted using only grade 6 or 7 students. Comparisons could also be made between older and younger children to see whether participating in these programs and reading frequency affects them differently.

Finally, research in the future may be well-directed to focus on impacts of summer reading frequency during the school year. Although there is some research on this, additional studies could make direct comparisons between low and high readers during the school year and how this affects their reading progress. For instance, further follow-ups of the participants from this study or similar studies could be conducted, examining the reading skills of high versus low readers at later times during the school year. Based on previous research, it could be expected that the high readers would maintain higher reading skills than the low readers.

Practical Importance

There are some important practical contributions and implications that this research makes to the study of summer library reading programs and reading frequency. Given that summer library reading programs have never been evaluated empirically before, and that the present study did not find as many significant effects as it could have, there may be room for improvement with these programs.

Researchers were able to conclude that participating in the program improves reading comprehension, but only if children read a significant amount. Therefore, these programs do seem to be effective if children read often. However, as the basis of the program is to encourage more summer reading, it is difficult to conclude whether the program is effective if not all children are actually reading a considerable number of

books. Perhaps aspects of the program can be changed to better encourage all children participating to read a lot. For example, more reading tasks could be incorporated into the game that is played when children come to the library for the program. It is also possible that children would read more if they received prizes for each book they have read. Finally, given that the correlational results showed that parent attitudes toward reading are related to how much their children read, involving parents in program activities and encouraging them to motivate their kids to read could be beneficial.

The fact that some reading measures did not have significant results suggests that, in some components of reading, such as grammar, and vocabulary, reading a significant amount does not lead to more growth than reading little. Perhaps more than just broad reading is needed for these programs. Direct instruction may be needed in addition to stimulate improvement in all aspects of reading (Kim, & White, 2008). For struggling readers, more assistance is needed to make improvements in reading over the summer than this basic summer library reading program. They may need direct instruction in decoding and comprehending written text to improve their reading skills, something that summer library reading programs do not offer. Perhaps the broad reading aspect of these library programs is more effective in improving reading skills of average and higher level readers than low level readers. At the very least, these programs are not effective if the children do not read. Further demonstrated positive effects of summer library reading programs could have an influence in obtaining more funding and resources for the programs across Ontario. In this way, many more children could receive any possible benefits that this program has to offer.

There also seems to be a problem with these library programs in terms of accessibility. Most participants in the program seemed to be mid to high socioeconomic status (SES), rather than low SES. Since the present study focused only on low SES children, it became evident that not many low SES children attend these programs. Out of 69 low SES participants, only 16 chose to participate in the program. This is unfortunate, because low SES children are often the ones who need the additional reading practice, given that they experience less growth in reading over the summer than high SES children (Alexander et al., 2001). Additional promotion of the summer library reading programs in low SES schools could help make more children and parents aware of the programs. Schools and teachers could also help to make parents aware of the drawbacks to not reading over summer holidays and how these programs can help with that. It is also possible that more practical aspects would help to make the programs more accessible to low SES families. For example, if libraries provided childcare, this could make trips to the library easier for parents with several children. Free parking provided by the city might also help to make the library more accessible to low SES families. Having to pay for parking each time they visit the library might contribute to these families visiting the library less often. It is hoped that if awareness of these programs is raised in low SES schools and some of these practical issues are addressed, that more low SES children will attend summer library reading programs.

Conclusion

In terms of conclusions, although this study did not find much evidence to support the hypothesis that participating in summer library reading programs improves children's

skills in reading, this does not mean that the programs do not have the potential of doing just that. There was some evidence that children who were enrolled in the programs and read a lot had improved reading comprehension. It was also found that children who read more had greater reading gains over the summer than children who did not read much. Therefore, as long as the programs successfully encourage children to read, improvements in their reading skills should follow. Additionally, given that the correlations showed that parental attitudes toward reading are related to how much their children read, adapting the programs to involve parents in motivating their children to read could be helpful. Furthermore, this was a preliminary, small-scale study focusing on only one library program. Further research should be conducted before conclusions can be made about the efficacy of these programs.

Appendix A

I.D. #_____

WILFRID LAURIER UNIVERSITY

INFORMED CONSENT STATEMENT FOR PRINCIPAL

Summer Library Reading Programs and Literacy: An Assessment of Children's Reading Progress after Having Participated in a Summer Library Reading Program
Investigators: Ashley Van Andel, Dr. Alexandra Gottardo

Students in grades 2 to 5 at your school are invited to participate in a research study. The purpose of this study is to evaluate the effects of summer reading on children. Ashley Van Andel is the primary investigator working under Dr. Alexandra Gottardo. Ashley is a first year Masters student in Developmental Psychology at Wilfrid Laurier University.

INFORMATION

This study will consist of the effects of participating in the Summer Reading Program at the Kitchener Public Library on children's reading achievement. Participants will be doing tasks that examine the skills involved in reading. The tasks will include tests of reading comprehension, word reading, vocabulary, short-term memory, concepts about print, and oral language. We are hoping that the testing will take place at your school. Each child will be tested twice, once in May 2010 and once in September 2010. For each session, each child is required to be tested for about 45 minutes for a total of 1 ½ hours. We hope that approximately 100 children will be participating in the study. Your students will be informed that they can refuse to participate in testing or discontinue participation at any time without penalty or loss. Parents are also asked to complete two questionnaires (a Language Questionnaire and a Parent-Activity Questionnaire), which should take no more than a total of half an hour to complete, as well as a "Reading at home" tracking sheet. This tracking sheet will be filled out every week, for the duration of the summer holidays, or 10 weeks. This should take less than 10 minutes per week, for a total of 1 hour and 40 minutes or less.

RISKS

There are no risks different from what children would find completing ordinary school activities. Naturally, some children may lose self-confidence after what they feel may be a poor performance. However, children will not know how well they are doing. Wrong answers are followed by the same reaction ("good", "excellent", etc.) from testers as are right answers. Children will be encouraged and praised constantly regardless of performance. Praise will also be given for effort.

BENEFITS

By evaluating the effects of this reading program, teachers and parents will be able to appreciate the true value and effectiveness of summer library reading programs for elementary school-aged children. Most children enjoy the one-to-one attention that results

from participation in a study and the encouragement and praise that they receive. Each student will receive stickers after completing each testing session and a book at the end of the second testing session.

CONFIDENTIALITY

The participants' confidential data files will be given a confidential number that will be used for all data entry and data analysis purposes. No other identifying information will be available. Information obtained from the demographic questionnaire, which contains participant names, will be transferred to each participant's ID number. Group scores will be reported at professional conferences for literacy researchers and teachers, but no individual scores will be reported or discussed with anyone at any time. Data will be stored securely in a locked filing cabinet at the university. Personal identifiers will be removed from the data immediately after it is collected, and consent forms and demographic questionnaires will be stored separately from other data in a locked cabinet. Electronic files will be securely stored on a password protected computer in Dr. Gottardo's locked lab. Only research personnel and students at Wilfrid Laurier University (Alexandra Gottardo, Ashley Van Andel, Miriam Fine, Daniel Colangelo, Vicki Colotelo) will have access to the data for data entry and analysis purposes only. Data will be retained for 7 years, until participants, teachers, principals, and library staff are notified of results. After this, as of December 31, 2017, all forms of data will be destroyed by Ashley Van Andel. Testing will be coordinated by the students listed above from Wilfrid Laurier University who have experience testing children. Testers have been trained in the lab of Dr. Alexandra Gottardo.

COMPENSATION

Testers will hand out small gifts, such as decorated pencils and erasers, to participants upon completion of each testing session. All participants will receive a book at the end of the study, as will the other members of the class who did not participate.

CONTACT

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study) you may contact the researcher, Ashley Van Andel a vanx5580@wlu.ca and 519-884-0710 extension 2933 or Dr. Alexandra Gottardo at extension 2169 or at agottard@wlu.ca. Alternatively, you can contact us by mail at 75 University Avenue West, Waterloo, Ontario N2L 3C5. This project has been reviewed and approved by the University Research Ethics Board and the Waterloo Region District School Board Research Review Committee. If you feel your students have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-0710, extension 5225, rbasso@wlu.ca.

PARTICIPATION

Participation in this study is voluntary; participants may decline to participate without penalty. If participants decide to participate, they may withdraw from the study at any time without penalty and without loss of benefits to which they are otherwise entitled. If

they withdraw from the study before data collection is completed their data will be returned to them or destroyed. They have the right to omit any question(s)/procedure(s) they choose. School grades are not determined by this testing and no information about their performance will be provided to the school. Data cannot be withdrawn after data collection is complete as they are stored without identifiers.

FEEDBACK AND PUBLICATION

The results of this study will be submitted for a Master's thesis. Results may also be presented at reading conferences and in journal articles. Feedback will be available by January 31, 2011.

Feedback regarding the general findings of the study will be provided to you by January 31, 2011.

CONSENT

I have read and understand the above information. I have received a copy of this form. I agree to allow my students to participate in this study.

Principal's name _____ Date: _____

Principal's signature _____ Date: _____

Appendix B

I.D. #_____

WILFRID LAURIER UNIVERSITY

INFORMED CONSENT STATEMENT FOR PARENTS

Summer Library Reading Programs and Literacy: An Assessment of Children's Reading Progress after Having Participated in a Summer Library Reading Program
Investigators: Ashley Van Andel, Dr. Alexandra Gottardo

Your child is invited to participate in a research study. The purpose of this study is to evaluate the effects of summer reading on children. Ashley Van Andel is the primary investigator working under Dr. Alexandra Gottardo. Ashley is a first year Masters student in Developmental Psychology at Wilfrid Laurier University.

INFORMATION

This study will consist of the effects of participating in the Summer Reading Program at the Kitchener Public Library on children's reading achievement. All participants will do reading tasks, but not all participants will participate in the Summer Reading Program. You and your child may choose whether or not you wish to participate in the Summer Reading Program. The reading tasks will include tests of reading comprehension, word reading, vocabulary, short-term memory, concepts about print, and oral language. The testing will take place at your child's school. Each child will be tested twice, once in May/June 2010 and once in September 2010. For each session, each child is required to be tested for about 45 minutes for a total of 1 ½ hours. There are approximately 100 children who will be participating in the study. Your child will be informed that they can refuse to participate in testing or discontinue participation at any time without penalty or loss. You are also asked to complete two questionnaires (a Language Questionnaire and a Parent-Activity Questionnaire), which should take no more than a total of half an hour to complete, as well as a "Reading at home" tracking sheet. This tracking sheet will be filled out every week, for the duration of the summer holidays, or 10 weeks. This should take less than 10 minutes per week, for a total of 1 hour and 40 minutes or less. You may refuse to answer any questions on the questionnaire.

RISKS

There are no risks different from what children would find completing ordinary school activities. None of the test results count towards your child's marks at school. Naturally, some children may lose self-confidence after what they feel may be a poor performance. However, children will not know how well they are doing. Wrong answers are followed by the same reaction ("good", "excellent", etc.) from testers as are right answers. Children will be encouraged and praised constantly regardless of performance. Praise will also be given for effort.

BENEFITS

By evaluating the effects of this reading program, teachers and parents will be able to appreciate the true value and effectiveness of summer library reading programs for

elementary school-aged children. Most children enjoy the one-to-one attention that results from participation in a study and the encouragement and praise that they receive. Each student will receive a small gift after completing each testing session and a book at the end of the second testing session.

CONFIDENTIALITY

The participants' confidential data files will be given a confidential number that will be used for all data entry and data analysis purposes. No other identifying information will be available. Information obtained from the demographic questionnaire, which contains participant names, will be transferred to each participant's ID number. Group scores will be reported at professional conferences for literacy researchers and teachers, but no individual scores will be reported or discussed with anyone at any time. Data will be stored securely in a locked filing cabinet at the university. Personal identifiers will be removed from the data immediately after it is collected, and consent forms and demographic questionnaires will be stored separately from other data in a locked cabinet. Electronic files will be securely stored on a password protected computer in Dr. Gottardo's locked lab. Only research personnel and students at Wilfrid Laurier University (Alexandra Gottardo, Ashley Van Andel, Miriam Fine, Daniel Colangelo, Vicki Colotelo) will have access to the data for data entry and analysis purposes only. Data will be retained for 7 years, until participants, teachers, principals, and library staff are notified of results. After this, as of December 31, 2017, all forms of data will be destroyed by Ashley Van Andel. Testing will be coordinated by the students listed above from Wilfrid Laurier University who have experience testing children. Coordinators have been trained in the lab of Dr. Alexandra Gottardo.

COMPENSATION

Testers will hand out small gifts, such as decorated pencils and erasers, to participants upon completion of each testing session. All participants will receive a book at the end of the study, as will the other members of the class who did not participate.

CONTACT

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study) you may contact the researcher, Ashley Van Andel a vanx5580@wlu.ca and 519-884-0710 extension 2933 or Dr. Alexandra Gottardo at extension 2169 or at agottard@wlu.ca. Alternatively, you can contact us by mail at 75 University Avenue West, Waterloo, Ontario N2L 3C5. This project has been reviewed and approved by the University Research Ethics Board and the Waterloo Region District School Board Research Review Committee. If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-0710, extension 5225, rbasso@wlu.ca.

PARTICIPATION

Your participation and your child's participation in this study are voluntary; you both may decline to participate without penalty. If you and your child decide to participate,

you both may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you and your child withdraw from the study before data collection is completed your data will be returned to you or destroyed. You and your child have the right to omit any question(s)/procedure(s) you choose. School grades are not determined by this testing and no information about your performance will be provided to the school. Data cannot be withdrawn after data collection is complete as they are stored without identifiers.

FEEDBACK AND PUBLICATION

The results of this study will be submitted for a Master's thesis. Results may also be presented at reading conferences and in journal articles. Feedback will be available by January 31, 2011.

If you would like feedback regarding the general findings of the study, please include your address in the space provided below. Research findings will be mailed to you by January 31, 2011.

Please sign and return this form by May 21, 2010 if you agree to participate in this study.

Address: _____ City: _____

_____

Postal code: _____ Telephone: _____

CONSENT

I have read and understand the above information. I have received a copy of this form. I agree to participate and permit my child to participate in this study.

Participant's name _____ Date of Birth: _____

Parent's name _____ Date _____

Parent's signature_____ Date _____

I agree that the data concerning my child can be released to the Waterloo Region District School Board.

Parent's name _____ Date _____

Parent's signature_____ Date _____

Appendix C

INVITATION LETTER

Summer Library Reading Programs and Literacy: An Assessment of Children's Reading Progress after Having Participated in a Summer Library Reading Program

Investigators: Ashley Van Andel, Dr. Alexandra Gottardo
Wilfrid Laurier University

Your child is invited to participate in a research study. The purpose of this study is to evaluate the effects of summer reading on children. Ashley Van Andel is the primary investigator working under Dr. Alexandra Gottardo. Ashley is a first year Masters student in Developmental Psychology at Wilfrid Laurier University.

This study will consist of the effects of participating in the Summer Reading Program at the Kitchener Public Library on children's reading achievement. Your child will be doing tasks that examine the skills involved in reading. The tasks will include tests of reading comprehension, word reading, vocabulary, short-term memory, concepts about print, and oral language. Examples of tests include a vocabulary task in which children are asked to point to a picture that corresponds to a word, a working memory task in which children read a string of numbers and are asked to repeat the numbers, a reading comprehension task in which children read a passage with blanks and have to choose words to fill in the blanks, and a print exposure task in which children read a list of book titles and indicate which books they have heard of.

The testing will take place at your child's school. Each child will be tested twice, once in May 2010 and once in September 2010. Dates of the first session will be announced and will be sometime in May and June, and again in September and October. For each session, each child is required to be tested for about 45 minutes for a total of 1 ½ hours. Your child will be informed that they can refuse to participate in testing or discontinue participation at any time without penalty or loss.

There are approximately 100 children who will be participating in the study. Some participants will be participating in the Summer Reading Program at the Kitchener Public Library and some will not. You will be asked to decide whether you would like your child to participate in the Summer Library Reading Program. The program will begin at the beginning of July and finish at the end of August, and is free of cost. The Kitchener Public Library can accommodate as many children as choose to join the Summer Reading Club. Participants become members of the Summer Reading Club and can obtain small prizes and games by reading books and completing related tasks. Participants are encouraged to come to the library once a week to get books and to play a game that involves completing reading and other tasks. Once children complete the tasks they can enter a draw to win prizes. Library summer reading club staff listen to oral book reports or read written book reports for each book that is read. They also help children to pick out age-appropriate and interesting books. The main purpose of the program is to increase the

frequency of children's summer reading by providing reading material, thereby fostering reading improvement in fluency, vocabulary, and most important, reading enjoyment and confidence.

To sign up for the Summer Reading Club please visit or call the Kitchener Public Library (519-743-0271) for further information. Library staff will be able to assist you in enrolling in the Summer Reading Club.

You are also asked to complete two questionnaires (a Language Questionnaire and a Parent-Activity Questionnaire), which should take no more than a total of half an hour to complete, as well as a "Reading at home" tracking sheet. This tracking sheet will be filled out every week, for the duration of the summer holidays, or 10 weeks. This should take less than 10 minutes per week, for a total of 1 hour and 40 minutes or less. You may refuse to answer any questions on the questionnaire.

The consent form must be signed and returned to your child's school by May 21, 2010 if you wish to participate in this study.

WHERE CAN I GET ADDITIONAL HELP OR RESOURCES IF I NEED THEM?

If you have any questions or concerns about your child or yourself, we have provided you a list of names and phone numbers of researchers involved in the study, as well as the Wilfrid Laurier Ethics Board Chair, who can assist with any questions or concerns that you might have.

If you have any questions concerning the collection of this information, please contact:

Dr. Alexandra Gottardo
Department of Psychology
Wilfrid Laurier University
Waterloo, Ontario N2L 3C5
Telephone: (519) 884-0710 ext. 2169
Email: agottard@wlu.ca.

Ms. Ashley Van Andel
Department of Psychology
Wilfrid Laurier University
Waterloo, ON N2L 3C5
Telephone: (519) 884-0710, ext. 2933
Email: vanx5580@wlu.ca

or

Dr. Robert Basso
Chair, University Research Ethics Board
Wilfrid Laurier University Telephone: (519) 884-0710, ext. 5225

Email: rbasso@wlu.ca.

Alternatively, you can contact us by mail at 75 University Avenue West, Waterloo, Ontario N2L 3C5.

Appendix D

Oral Statement of Consent for Young Children

Hi. My name is _____ . I wanted to try some activities with you and play some reading games with you. These games are going to be pretty fun and all you have to do is try your best. If you do not want to play at any time, just tell me and we can stop. After we finish, I'll give you a small gift for working so hard. Do you want to try some of these reading games with me?

Appendix E

Child's Name:_____

Date: _____

Language and Demographic Questionnaire

In order to better understand the factors that influence a child's reading skills and habits, we would like to obtain some information about language use in the home. We would greatly appreciate it if you would complete the following questions concerning your family and your child who is in the study.

1. Circle who is completing this questionnaire: Mother Father Other: _____

2. What is your native language(s)? _____

What is your native country? _____

If you were not born in Canada, at what age did you move to Canada? _____

3. Please place an X beside the highest level of education that you have attained.

_____ Elementary school
_____ Some high school studies
_____ Completed high school
_____ Some college or university studies
_____ Completed college diploma
_____ Completed undergraduate degree
_____ Some postgraduate studies
_____ Completed graduate or professional degree

4. For each of the following **English** language skills, please rate how well you feel that you can currently perform the skill.

			ability									
			none									very fluent
Understanding			1	2	3	4	5	6	7	8	9	10
Speaking			1	2	3	4	5	6	7	8	9	10
Reading			1	2	3	4	5	6	7	8	9	10
Writing			1	2	3	4	5	6	7	8	9	10

5. How many children's books do you currently have in the house that are in English? Place an x beside the appropriate category:

____ 0-5 ____ 6-10 ____ 11-15 ____ 16-20 ____ 21-25 ____ 25 or more

6. How often do you visit the public library with your child in a typical month?

____ 0 ____ 1-3 ____ 3-5 ____ 6-8 ____ 8 or more

Thank you

Appendix F

Parent Activity Choice Questionnaire

Below you will see several lists of two activities, and will be asked to choose the activity that you are more likely to do on any given day. Please put a check mark next to the one that you more typically would carry out. Even if you would prefer not to do either activity, please pick the one that you would be more likely to do. For each item, please mark only one choice.

1. I am more likely to:
___ listen to music of my choice
___ watch a television program of my choice

2. I am more likely to:
___ cook or clean at home
___ listen to music of my choice

3. I am more likely to:
___ spend time on my hobbies
___ attend a movie of my choice

4. I am more likely to:
___ spend time on my hobbies
___ watch a television program of my choice

5. I am more likely to:
___ read a book of my choice
___ exercise or work out

6. I am more likely to:
___ cook or clean at home
___ spend time on my hobbies

7. I am more likely to:
___ attend a movie of my choice
___ talk on the phone with family or friends

8. I am more likely to:
___ read a book of my choice
___ listen to music of my choice

9. I am more likely to:
___ exercise or work out
___ attend a movie of my choice

10. I am more likely to:
___ talk on the phone with family or friends
___ read a book of my choice

11. I am more likely to:
___ watch a television program of my choice
___ talk on the phone with family or friends

12. I am more likely to:
___ cook or clean at home
___ exercise or work out

13. I am more likely to:
___ exercise or work out
___ watch a television program of my choice

14. I am more likely to:
___ attend a movie of my choice
___ listen to music of my choice

15. I am more likely to:
___ read a book of my choice
___ cook or clean at home

16. I am more likely to:
___ talk on the phone with family or friends
___ spend time on my hobbies

Date: _____

Appendix G

Reading at Home Tracking Sheet

Parent's Name _____

Child's Name _____

	Number of hours you read with your child this week	Number of hours child read to self or others this week	Number of books your child read this week
June 27 – July 3			
July 4 - 10			
July 11 – 17			
July 18 – 24			
July 25 – 31			
August 1 – 7			
August 8 – 14			
August 15 – 21			
August 22 – 28			
August 29 – September 4			

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Table 1:
Averages of quantitative demographic variables comparing treatment groups

	Treatment			Control		
	Mean	N	SD	Mean	N	SD
Highest Level of Parent Education	5.5	14	1.16	4.92	36	1.75
Number of Children's Books in the House	5.73	15	0.70	5.17	36	1.5
Number of Times Parent and Child Visit Library Each Month	2.21	14	0.70	1.56	36	0.70
Parent English Skills	9.02	14	1.23	9.27	36	1.11
Preferred Parent Activity	2.21	14	1.12	1.97	33	1.57
Books Children Read Over the Summer	21.6	15	31.62	14.83	47	20.69

*Average level of parent education, 5 = completed college diploma, 6 = completed undergraduate degree.
*Parent English skills was measured on a scale out of 10.
*Preferred parent activity was coded on a scale of 0 to 4. Parents could indicate preferring reading over other activities a minimum of 0 and a maximum of 4 times on the demographic questionnaire.

Table 2:
Averages of quantitative demographic variables comparing high and low readers

	High Readers			Low Readers		
	Mean	N	SD	Mean	N	SD
Highest Level of Parent Education	5.75	16	1.73	4.58	31	1.36
Number of Children's Books in the House	5.5	16	0.97	5.19	32	1.53
Number of Times Parent and Child Visit Library Each Month	1.8	15	0.86	1.72	32	0.73
Parent English Skills	9.42	16	0.80	9.09	31	1.27
Preferred Parent Activity	2.67	15	1.29	1.69	29	1.44
Books Children Read Over the Summer	42.59	17	32.76	6.52	44	4.95

*Average level of parent education, 4 = some college or university, 5 = completed college diploma, 6 = completed undergraduate degree.
*Parent English skills is measured on a scale out of 10.
*Preferred parent activity was coded on a scale of 0 to 4. Parents could indicate preferring reading over other activities a minimum of 0 and a maximum of 4 times on the demographic questionnaire.

Table 3:
Design and constructs measured at each data collection time

Measures
Word Reading, Fluency and Accuracy - Woodcock Reading Mastery Test-Revised (WRMT-R) i) Word reading ii) Pseudoword reading - Test of Word Reading Efficiency (TOWRE) iii) Sight word efficiency iv) Phonetic decoding efficiency
Phonological Awareness - Comprehensive Test of Phonological Processing (CTOPP) v) Segmenting words vi) Segmenting nonwords vii) elision
Reading Comprehension - Woodcock Language Proficiency Battery-Revised (WLPB-R) viii) Passage comprehension
Working Memory - Comprehensive Test of Phonological Processing (CTOPP) ix) Memory for digits
Vocabulary - Peabody Picture Vocabulary Test-III (PPVT III) - Expressive Vocabulary Test (EVT)
Automaticity - Comprehensive Test of Phonological Processing (CTOPP) x) RAN digits
Grammar - Clinical Evaluation of Language Fundamentals-III (CELF-III) xi) Sentence assembly
Non-Verbal Reasoning - Matrix Analogies Test (MAT)
Print Exposure - Title Recognition Test (TRT)

Table 4:
Correlation Matrix of Reading Measures at Post-test

	PPVT	Word ID	Word Attack	Digit Span	RAN Digits	Seg Words	Seg Non words
PPVT	-	-	-	-	-	-	-
Word ID	N = 69 r =0.55** p < 0.001	-	-	-	-	-	-
Word Attack	N = 69 r =0.34** p = 0.004	N = 69 r = 0.82** p < 0.001	-	-	-	-	-
Digit Span	N = 69 r = 0.30* p = 0.01	N = 69 r = 0.46** p < 0.001	N = 69 r = 0.42** p < 0.001	-	-	-	-
RAN Digits	N = 69 r = -0.27* p = 0.03	N = 69 r = 0.53** p < 0.001	N = 69 r = -0.42** p < 0.001	N = 69 r = -0.24 p = 0.05	-	-	-
Seg Words	N = 69 r = 0.25* p = 0.04	N = 69 r = -0.38** p = 0.002	N = 69 r = 0.38** p = 0.001	N = 69 r = 0.31** p = 0.01	N = 69 r = -0.09 p = 0.49	-	-
Seg Non words	N = 69 r = 0.19 p = 0.13	N = 69 r = 0.28* p = 0.002	N = 69 r = 0.29* p = 0.02	N = 69 r = 0.33** p = 0.01	N = 69 r = -0.24* p = 0.046	N = 69 r =0.63** p < 0.001	-

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5:
Correlation Matrix of Reading Measures at Post-test Continued

	Elision	Sent. Assem.	TOWRE Words	TOWRE Nonwords	EVT	Passage Comp	MAT	TRT
Elision	-	-	-	-	-	-	-	-
Sent. Assem.	N = 69 r =0.63** p < 0.001	-	-	-	-	-	-	-
towre Words	N = 69 r =0.75** p < 0.001	N = 69 r =0.59** p < 0.001	-	-	-	-	-	-
towre Non words	N = 69 r =0.74* p < 0.001	N = 69 r =0.60** p < 0.001	N = 69 r =0.91** p < 0.001	-	-	-	-	-
EVT	N = 69 r =0.52** p < 0.001	N = 69 r =0.55** p < 0.001	N = 69 r =0.38** p = 0.001	N = 69 r =0.42** p < 0.001	-	-	-	-
Passage Comp	N = 69 r =0.74** p < 0.001	N = 69 r =0.71** p < 0.001	N = 69 r =0.67** p < 0.001	N = 69 r =0.69** p < 0.001	N = 69 r =0.76** p <0.001	-	-	-
MAT	N = 69 r =0.69** p < 0.001	N = 69 r =0.54** p < 0.001	N = 69 r =0.42* p < 0.001	N = 69 r =0.45** p < 0.001	N = 69 r =0.53** p < 0.001	N = 69 r =0.65** p < 0.001	-	-
TRT	N = 69 r =0.40** p = 0.01	N = 69 r =0.37** p= 0.002	N = 69 r =0.32** p = 0.01	N = 69 r =0.35** p = 0.003	N = 69 r =0.33** p = 0.01	N = 69 r =0.39** p = 0.001	N = 69 r = 0.32** p = 0.01	-

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6:
Means by treatment group at pre-test

Reading Measure	Treatment Group								
	Control Group			Treatment Group			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
PPVT	53	120.43	26.61	16	126.75	21.38	69	121.90	25.49
Word ID	53	60.85	13.79	16	61.88	11.99	69	61.09	13.32
Word Attack	53	23.74	10.13	16	23.69	8.92	69	23.72	9.80
Digit Span	53	6.79	2.08	16	7.44	1.82	69	6.94	2.03
RAN Digits	53	39.63	20.23	16	36.68	9.57	69	38.95	18.30
Seg Words	53	9.38	3.81	16	9.06	2.77	69	9.30	3.58
Seg Nonwords	53	8.94	4.02	16	9.31	3.07	69	9.03	3.80
Elision	53	12.79	4.91	16	13.13	5.14	69	12.87	4.93
Sentence Assembly	53	3.85	4.03	16	5.88	4.76	69	4.32	4.26
TOWRE Words	53	60.06	15.87	16	61.81	10.41	69	60.46	14.73
TOWRE Non words	53	29.53	14.47	16	28.06	11.12	69	29.19	13.70
EVT	53	86.36	19.52	16	91.13	16.05	69	87.46	18.77
Passage Comp	53	19.98	5.18	16	21.75	4.55	69	20.39	5.07
MAT	53	8.43	4.45	16	10.00	3.10	69	8.80	4.21
TRT	53	0.07	0.08	16	0.10	0.08	69	0.08	0.08

Table 7:
Means by treatment group at post-test

Reading Measure	Treatment Group: Control Group			Treatment Group			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
PPVT	53	125.34	26.63	16	133.81	22.94	69	127.30	25.91
Word ID	53	63.91	14.28	16	63.50	9.73	69	63.81	13.30
Word Attack	53	23.32	9.71	16	23.13	10.33	69	23.28	9.78
Digit Span	53	6.72	2.02	16	7.00	1.97	69	6.78	2.00
RAN Digits	53	39.78	16.70	16	36.93	11.13	69	39.12	15.56
Seg Words	53	10.08	3.23	16	8.56	2.16	69	9.72	3.07
Seg Nonwords	53	9.66	4.00	16	9.56	3.56	69	9.64	3.88
Elision	53	13.57	4.92	16	15.13	4.84	69	13.93	4.91
Sentence Assembly	53	6.08	4.87	16	7.13	4.67	69	6.32	4.81
TOWRE Words	53	64.32	14.94	16	65.44	10.21	69	64.58	13.92
TOWRE Nonwords	53	31.58	14.97	16	30.69	11.84	69	31.38	14.23
EVT	53	90.42	17.95	16	97.88	14.76	69	92.14	17.45
Passage Comp	53	20.04	5.10	16	22.06	5.63	69	20.51	5.25
MAT	53	9.58	3.79	16	11.06	3.42	69	9.93	3.74
TRT	53	0.10	0.09	16	0.12	0.08	69	0.10	0.08

Table 8:
Means by reading frequency at pre-test

Reading Measure	Reading Frequency: Low Readers			High Readers			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
PPVT	44	114.05	24.35	17	131.47	23.35	61	118.90	25.15
Word ID	44	59.50	11.96	17	60.65	16.81	61	59.82	13.35
Word Attack	44	23.11	9.211	17	22.53	11.65	61	22.95	9.85
Digit Span	44	6.70	1.85	17	7.12	2.15	61	6.82	1.93
RAN Digits	44	40.45	22.03	17	35.68	8.81	61	39.12	19.32
Seg Words	44	9.25	3.21	17	8.88	4.11	61	9.15	3.45
Seg Nonwords	44	9.30	3.84	17	7.88	3.33	61	8.90	3.73
Elision	44	12.93	5.01	17	11.24	4.76	61	12.46	4.97
Sentence Assembly	44	3.91	3.94	17	3.88	4.09	61	3.90	3.95
TOWRE Words	44	59.27	15.42	17	60.59	14.37	61	59.64	15.03
TOWRE Nonwords	44	29.11	13.96	17	26.41	13.83	61	28.36	13.86
EVT	44	82.86	18.77	17	91.00	11.05	61	85.13	17.28
Passage Comp	44	19.50	5.07	17	21.18	4.72	61	19.97	5.00
MAT	44	8.59	4.01	17	8.35	4.15	61	8.52	4.01
TRT	44	0.08	0.08	17	0.07	0.09	61	0.08	0.08

Table 9:
Means by reading frequency at post-test

Reading Measure	Reading Frequency: Low Readers			High Readers			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
PPVT	44	119.77	26.58	17	138.94	21.12	61	125.11	26.46
Word ID	44	63.00	12.33	17	61.71	15.95	61	62.64	13.31
Word Attack	44	22.84	9.54	17	21.00	10.42	61	22.33	9.74
Digit Span	44	6.50	1.59	17	6.82	2.86	61	6.59	2.00
RAN Digits	44	39.18	17.65	17	39.39	12.86	61	39.24	16.35
Seg Words	44	9.84	2.91	17	8.82	2.72	61	9.56	2.87
Seg Nonwords	44	9.30	3.30	17	9.71	3.84	61	9.41	3.43
Elision	44	13.64	4.79	17	13.18	5.71	61	13.51	5.02
Sentence Assembly	44	6.36	4.58	17	5.00	5.16	61	5.98	4.74
TOWRE Words	44	63.82	15.13	17	64.88	12.85	61	64.11	14.43
TOWRE Nonwords	44	30.77	14.47	17	29.59	14.45	61	30.44	14.35
EVT	44	88.25	16.25	17	94.41	16.30	61	89.97	16.36
Passage Comp	44	19.45	4.89	17	20.82	5.51	61	19.84	5.06
MAT	44	9.57	3.91	17	9.88	3.55	61	9.66	3.78
TRT	44	0.10	0.09	17	0.11	0.08	61	0.10	0.08

Table 10:
Multivariate Reading Results by Reading Frequency and Treatment Group

	Word ID	RAN Digits	Seg Nonwords	Passage Comp
Main Effect, Covariate (Age)	$F(1, 40) = 0.02$ $p = 0.45$	$F(1, 40) = 0.15$ $p = 0.35$	$F(1, 40) = 0.24$ $p = 0.32$	$F(1, 40) = 1.09$ $p = 0.15$
Effect Size (Age)	Partial η2 = 0.000	Partial η2 = 0.004	Partial η2 = 0.006	Partial η2 = 0.03
Main Effect, Covariate (Parent Ed)	$F(1, 40) = 0.66$ $p = 0.21$	$F(1, 40) = 0.14$ $p = 0.35$	$F(1, 40) = 0.02$ $p = 0.45$	$F(1, 40) = 0.26$ $p = 0.31$
Effect Size (Parent Ed)	Partial η2 = 0.02	Partial η2 = 0.004	Partial η2 = 0.00	Partial η2 = 0.007
Main Effect, Covariate (MAT pre-test)	$F(1, 40) = 0.49$ $p = 0.24$	$F(1, 40) = 1.05$ $p = 0.156$	$F(1, 40) = 0.03$ $p = 0.43$	$F(1, 40) = 0.02$ $p = 0.44$
Effect Size (MAT pre-test)	Partial η2 = 0.01	Partial η2 = 0.03	Partial η2 = 0.001	Partial η2 = 0.001
Main Effect, Reading Freq	$F(1, 40) = 2.16$ $p = 0.08$	$F(1, 40) = 3.97$ $p = 0.03$*	$F(1, 40) = 1.93$ $p = 0.09$	$F(1, 40) = 0.002$ $p = 0.48$
Effect Size (Reading Freq)	Partial η2 = 0.05	Partial η2 = 0.09	Partial η2 = 0.05	Partial η2 = 0.00
Main Effect, Treat Group	$F(1, 40) = 0.78$ $p = 0.19$	$F(1, 40) = 0.52$ $p = 0.24$	$F(1, 40) = 0.01$ $p = 0.46$	$F(1, 40) = 4.09$ $p = 0.03$*
Effect Size (Treat Group)	Partial η2 = 0.02	Partial η2 = 0.01	Partial η2 = 0.00	Partial η2 = 0.09
Interaction (Treat Group x Reading Freq)	$F(1, 40) = 0.01$ $p = 0.46$	$F(1, 40) = 0.00$ $p = 0.50$	$F(1, 40) = 0.42$ $p = 0.26$	$F(1, 40) = 4.76$ $p = 0.02$*
Effect Size (Interaction)	Partial η2 = 0.00	Partial η2 = 0.00	Partial η2 = 0.01	Partial η2 = 0.11

Table 11:
Multivariate Reading Results by Reading Frequency

	Main Effect of Covariate (Age)	Effect Size (Covariate)	Main Effect of Reading Frequency	Effect Size (Reading Frequency)
WRMT-R Word ID	$F(1, 58) = 0.07$ $p = 0.40$	Partial $\eta 2 = 0.001$	$F(1, 58) = 3.59$ $p = 0.06$	Partial $\eta 2 = 0.06$
CTOPP RAN Digits	$F(1, 58) = 0.05$ $p = 0.41$	Partial $\eta 2 = 0.001$	$F(1, 58) = 3.72$ $p = 0.03$*	Partial $\eta 2 = 0.06$
CTOPP Segmenting Nonwords	$F(1, 58) = 0.18$ $p = 0.33$	Partial $\eta 2 = 0.003$	$F(1, 58) = 3.69$ $p = 0.03$*	Partial $\eta 2 = 0.06$
WLPB-R Passage Comprehension	$F(1, 58) = 0.07$ $p = 0.39$	Partial $\eta 2 = 0.001$	$F(1, 58) = 0.18$ $p = 0.34$	Partial $\eta 2 = 0.003$

Table 12:
Correlation Matrix of Demographic Variables

	Parent Education	Number of Children's Books in the House	Times Parent and Child Visit Library Each Month	Parent English Skills	Parent Activity Preference	Books Read Over the Summer
Parent Education	-	-	-	-	-	-
Number of Children's Books in the House	N = 50 $r = 0.33$* $p = 0.01$	-	-	-	-	-
Times Parent and Child Visit Library Each Month	N = 49 $r = 0.18$ $p = 0.11$	N = 50 $r = 0.19$ $p = 0.10$	-	-	-	-
Parent English Skills	N = 50 $r = 0.09$ $p = 0.26$	N = 50 $r = 0.42$** $p = 0.001$	N = 49 $r = 0.00$ $p = 0.50$	-	-	-
Parent Activity Preference	N = 47 $r = 0.25$* $p = 0.05$	N = 47 $r = 0.40$** $p = 0.003$	N = 46 $r = 0.32$* $p = 0.02$	N = 47 $r = 0.13$ $p = 0.19$	-	-
Books Read Over the Summer	N = 48 $r = 0.23$ $p = 0.06$	N = 49 $r = 0.03$ $p = 0.43$	N = 48 $r = 0.28$* $p = 0.03$	N = 48 $r = -0.04$ $p = 0.39$	N = 45 $r = 0.32$* $p = 0.02$	-

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 1.
Interaction between treatment group and frequency of summer book reading on reading comprehension.